

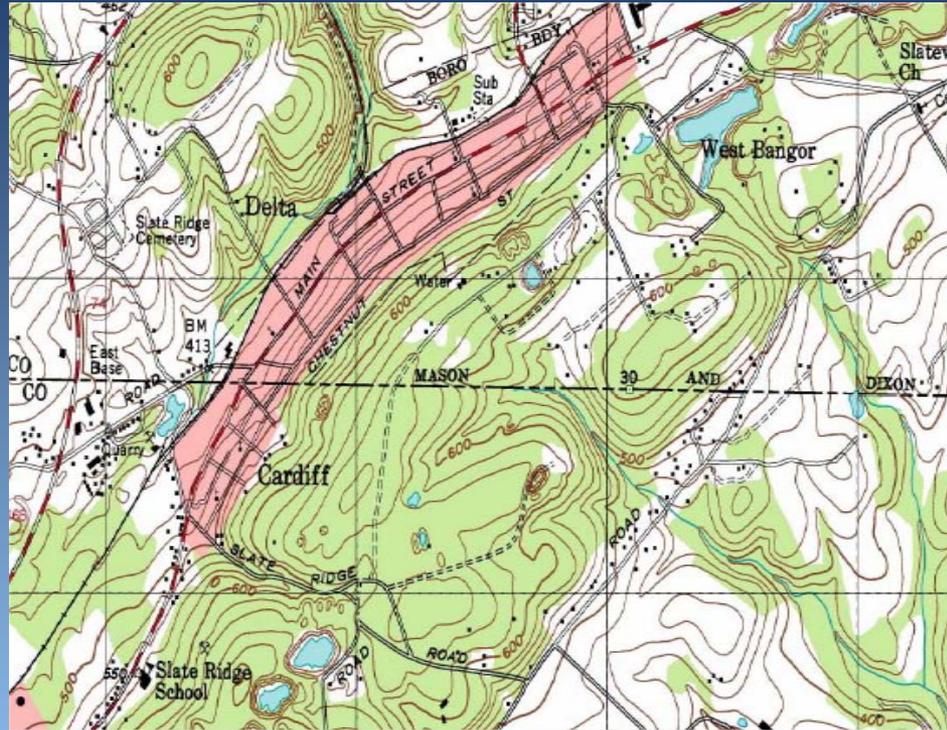
Building on 125 Years of Topographic Map Information: New Products and Services

Kari J. Craun

Celebration of 125 Years of Topographic Mapping

December 3, 2009

125 Years of Topographic Mapping



1880s Field sketching



1940s Mapping from stereophotography



1970s Electronic instrumentation



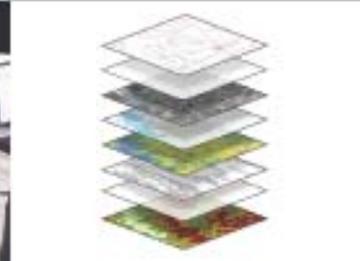
1980s Earth observing satellites

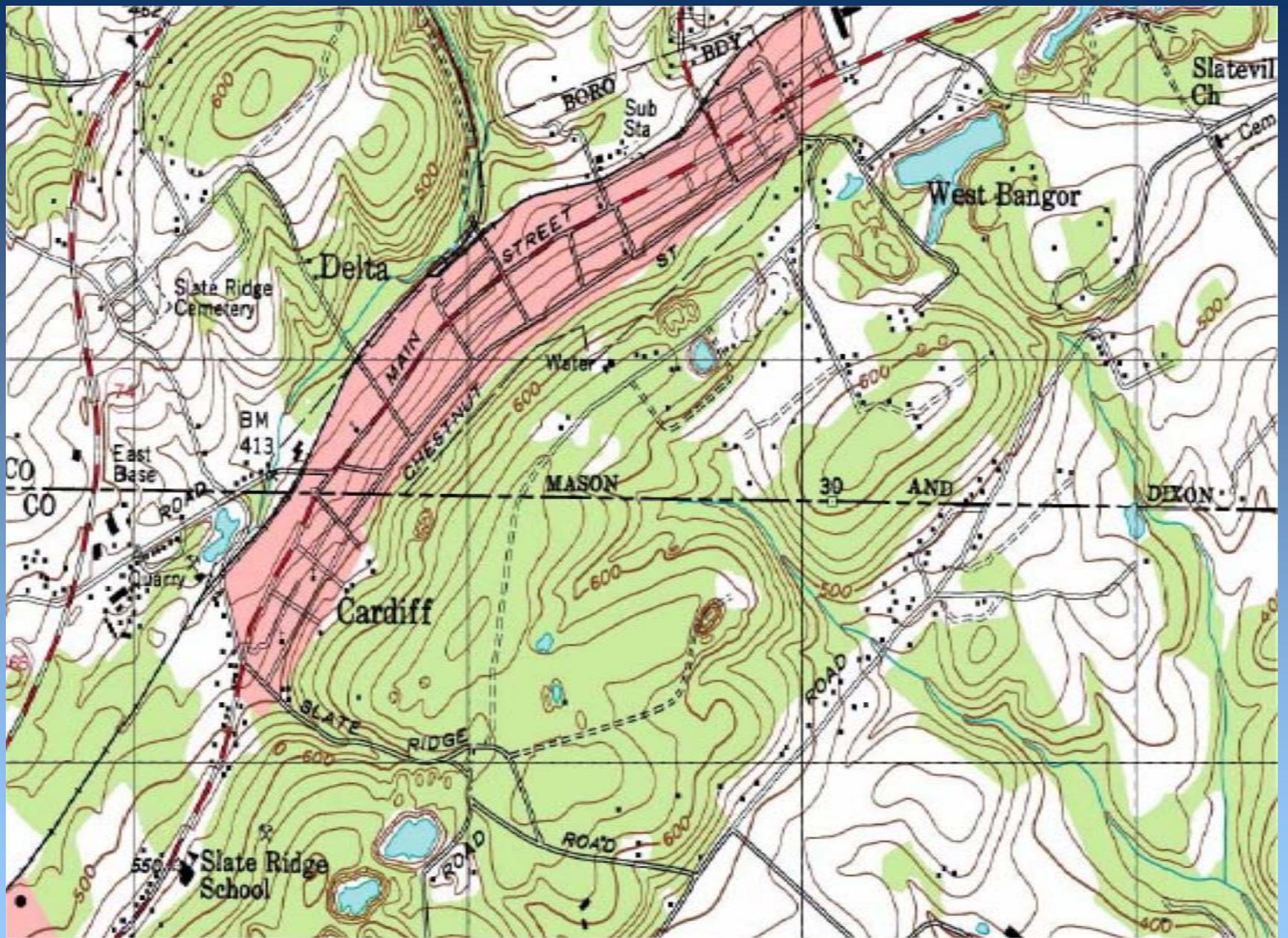


1990s Mapping with computers



2000s Mapping with the Internet



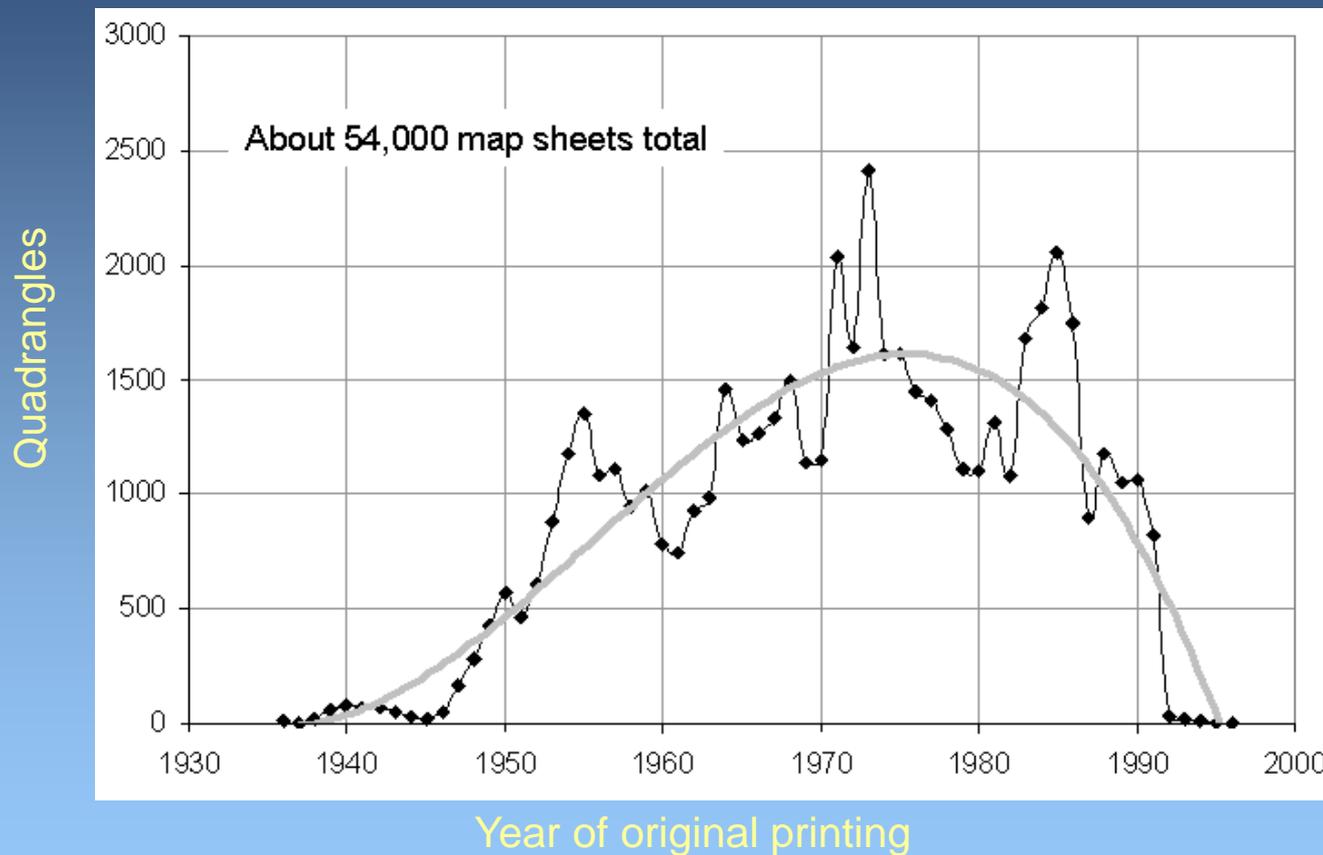




Product Characteristics

- **Consistent**
 - Map extent (consistent at scale; 7.5-minute extent)
 - Symbology
 - Projection/Coordinate System (georeferenced)
 - Collar
 - Quality
- **Complete**
- **Accessible**
- **Field-ready**
- **No copyright**

Original 7.5-minute coverage - contiguous 48 States



Building the Digital Foundation: Transition to Digital Data: 1970 to present

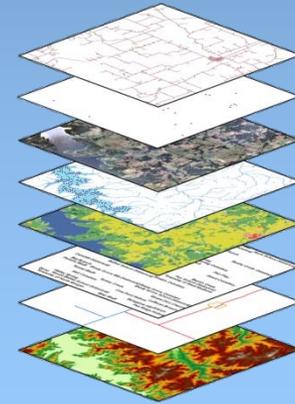
Analog

- Color separates
- Feature separates
- Aerial photographs
- Field notes

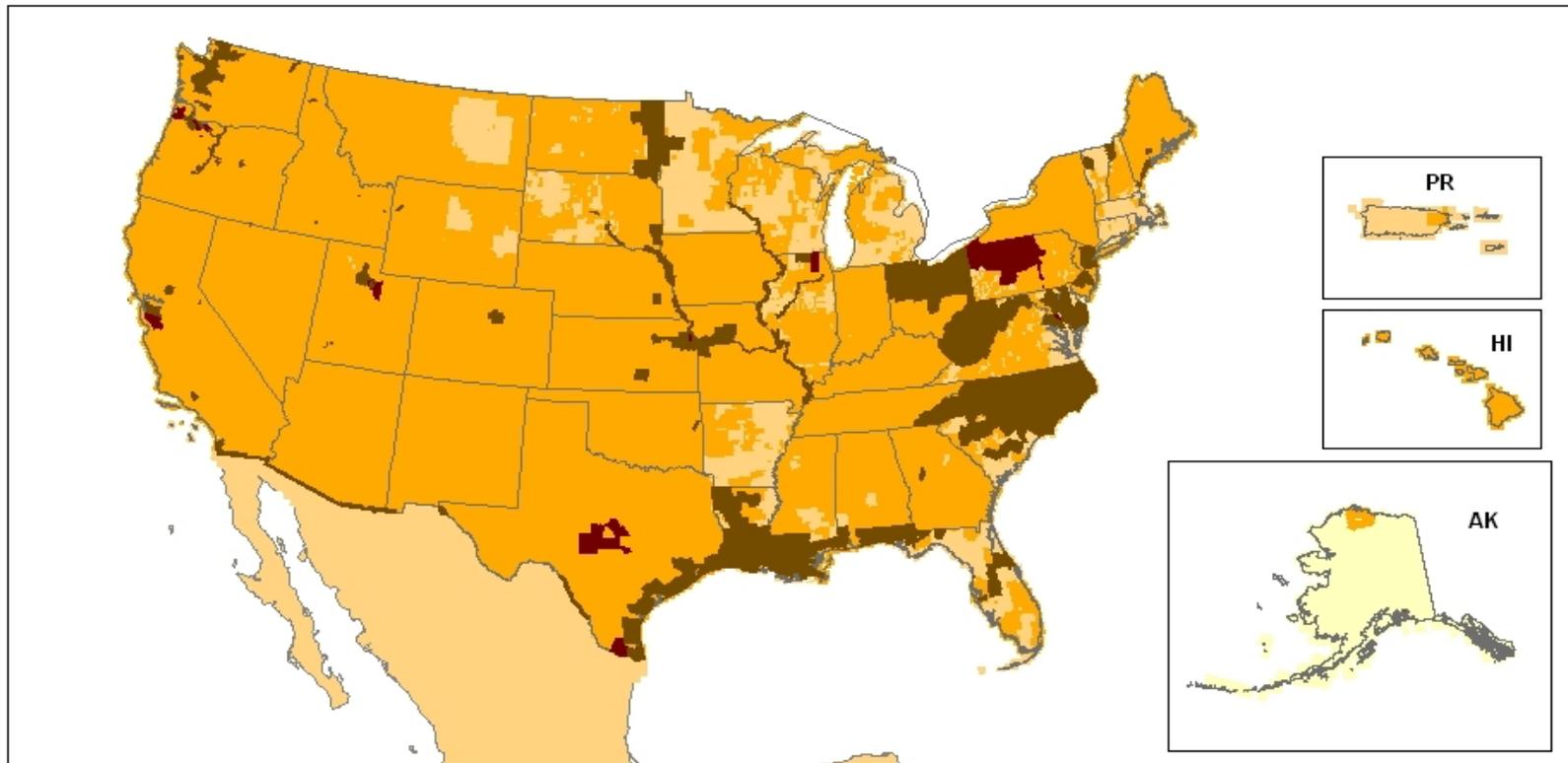


Digital

- Digital Vector Data
DLG-3, DLG-E,
DLG-F, NHD, BP
- Digital Raster Data
DEM, Digital Orthoimagery,
DRG
- Metadata



National Elevation Dataset Source Information



NED is a multi-resolution data collection which provides the best available digital elevation data to the public. 282,774 square miles of lower quality 30 meter data were replaced by 10 meter or better source data in 2009.

The NED 1/9-arc-second data layer has increased by 92,000 square miles and now cover 275,595 square miles.

The country of Mexico was also added at 30 meter resolution in 2009.

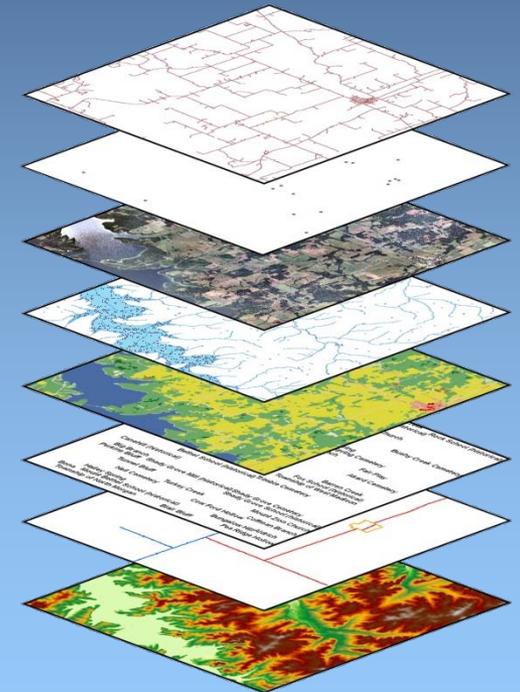
NED RESOLUTION

- High Resolution Data Being Processed
- 1/9 Arc-Second (~3 meter or LIDAR Source)
- 1/3 Arc-Second (~10 meter or better source)
- 1 Arc-Second (~30 meter source)
- 2 Arc-Second - Alaska Only

September 2009

The National Map

- *The National Map* includes eight data layers: transportation, structures, orthoimagery, hydrography, land cover, geographic names, boundaries, and elevation
- Public domain data to support
 - USGS topographic maps at 1:24,000-scale
 - Products and services at multiple scales and resolutions
 - Analysis, modeling and other applications at multiple scales and resolutions
- *The National Map* is built on partnerships and standards





***New Products from the
U.S. Geological Survey
National Geospatial
Program***



A New Generation of Topographic Maps



The National Map

US Topo

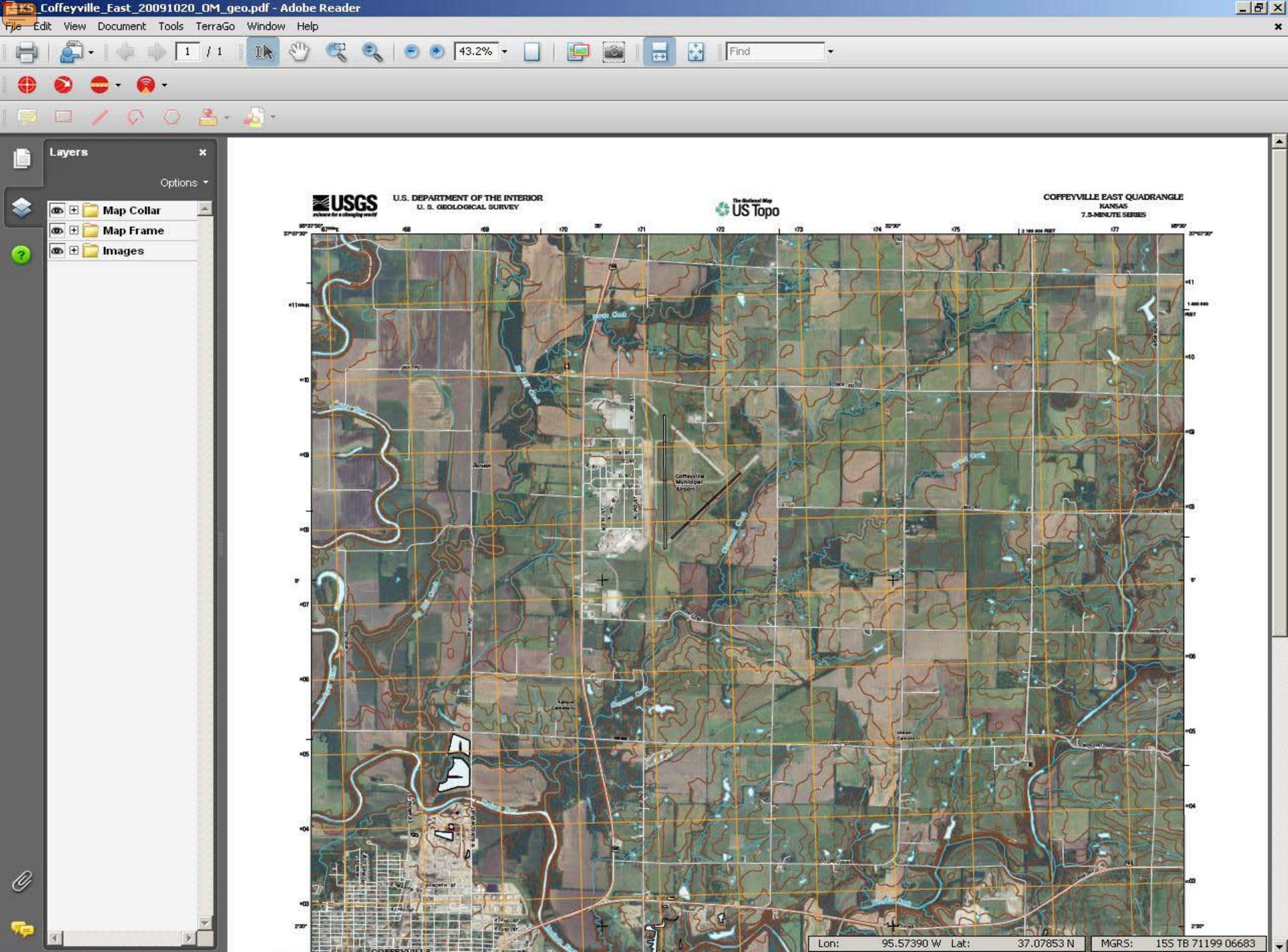
<http://nationalmap.gov>

A New Generation of Topographic Maps – Strategy

- Create next-generation USGS topographic maps
- 3 year revision cycle following NAIP – **13,200** produced in FY09; FY10 is 2nd year in cycle
- Source data from *The National Map* databases
- FY09 product “Digital Map-Beta”
 - Image background (NAIP)
 - Roads (Census MTAIP+)
 - Names (GNIS)
 - 1:24,000-scale layout (grids and collar standard)
- FY10 product US Topo
 - Contours and hydrography added
 - Contours generated from National Elevation Dataset (NED)
 - Hydrography from National Hydrography Dataset (NHD)

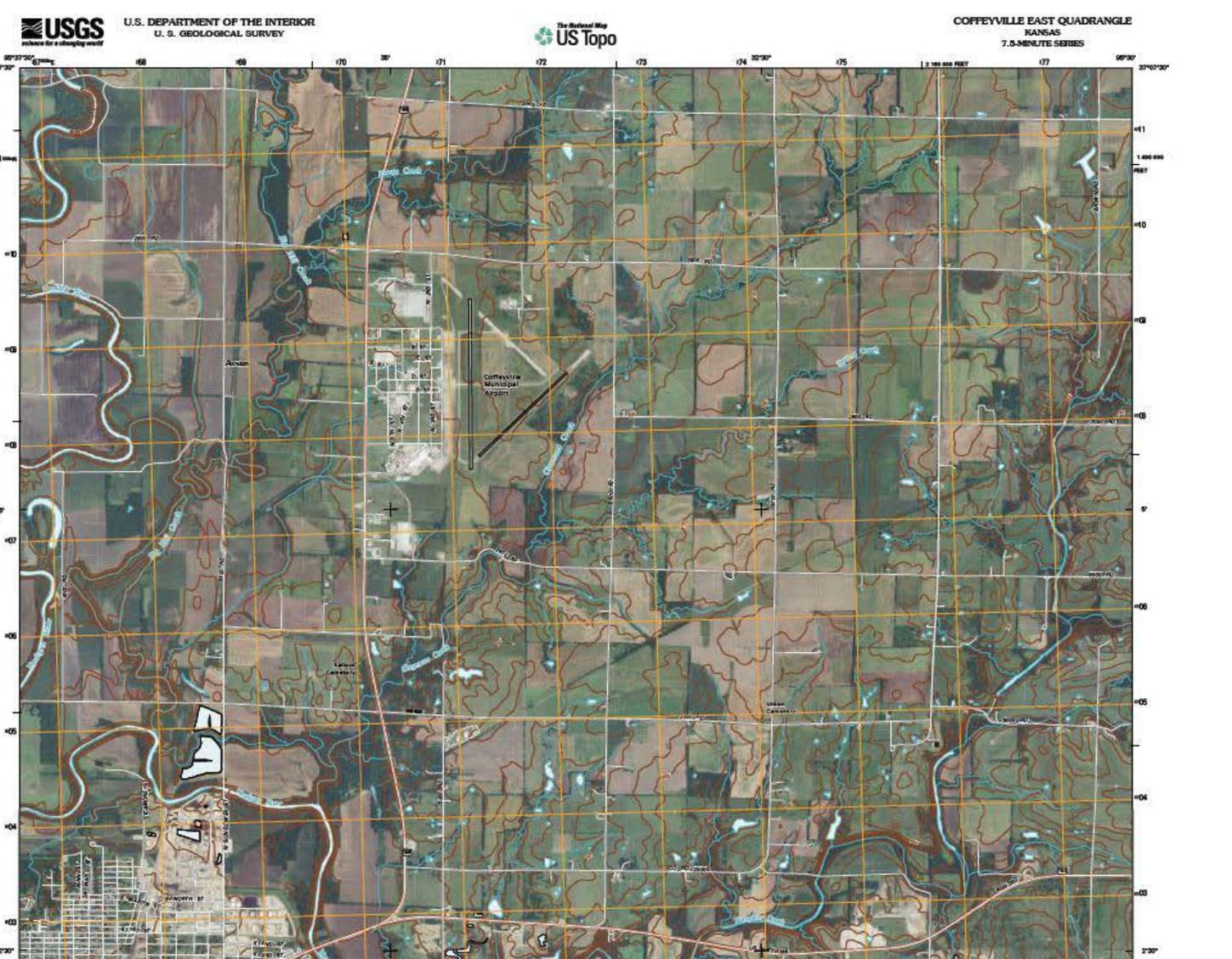
Product Characteristics

- **GeoPDF format**
 - A TerraGo Technologies published extension to the Adobe PDF file format
- **Georeferenced**
 - Locations defined in terms of map projection or coordinate systems
- **Layered (select layers, turn layers on/off)**
- **Plot/print ready**
- **Limited interactive capabilities, free tools**
- **File Size 15-20 Mb**
- **Free download**
 - Through the USGS Store



Layers Options

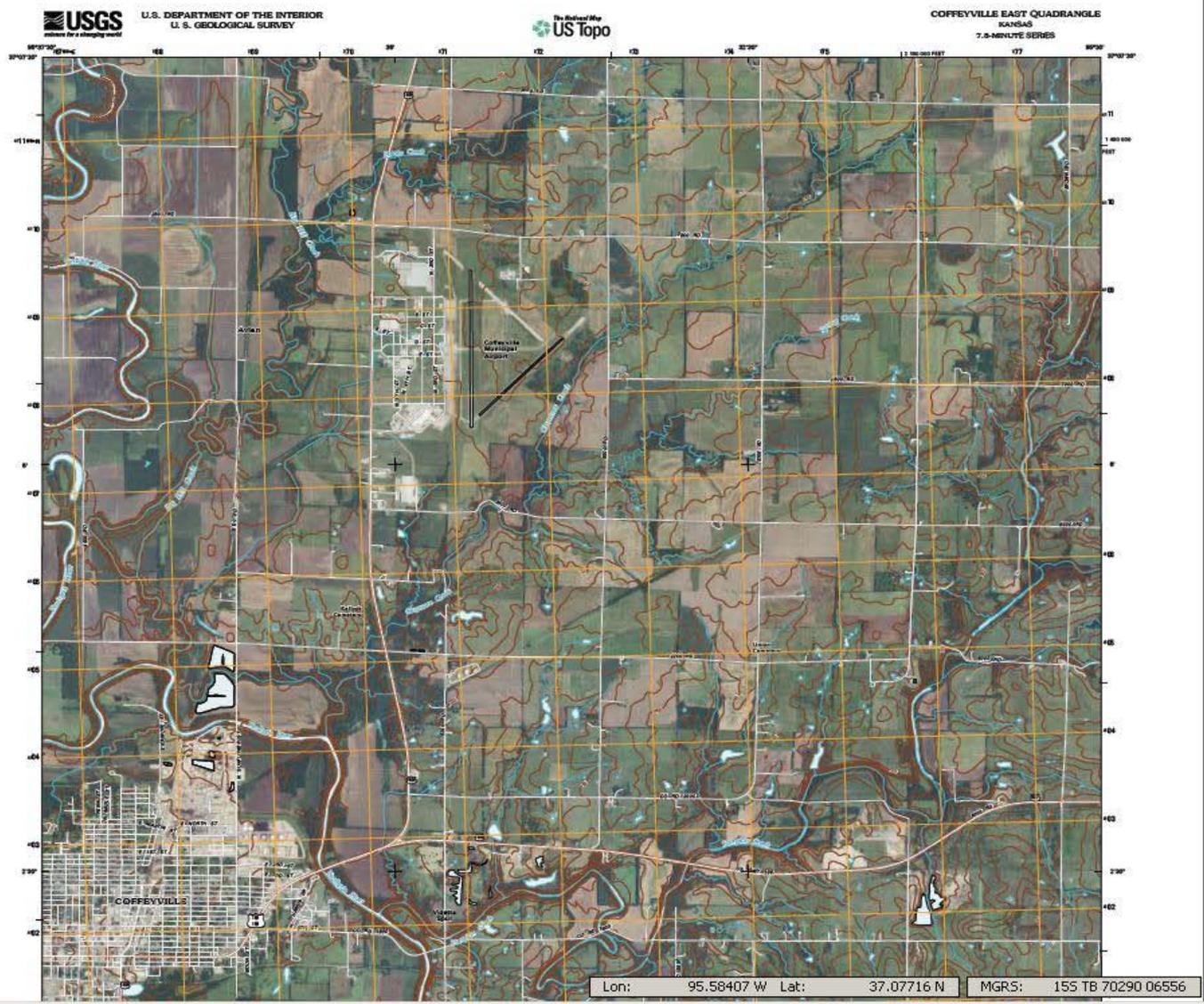
- Map Collar
- Map Frame
- Images



Layers [x]

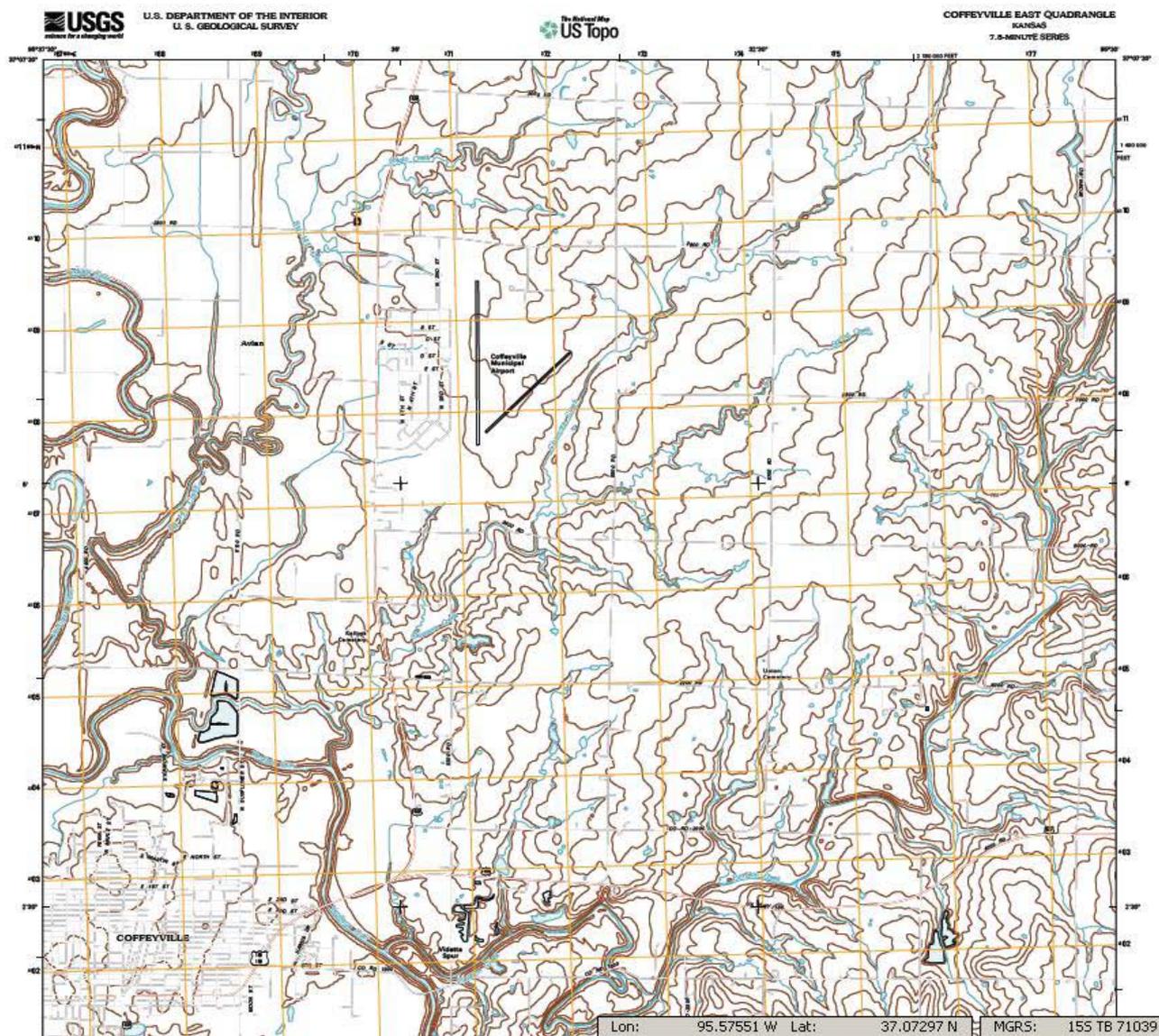
Options ▾

- Map Collar
- Map Elements
 - Map Frame
 - Projection and Grids
 - Geographic Names
 - Boundaries
 - Transportation
 - Road Names and Shields
 - Roads
 - Airport Names
 - Airports
 - Hydrography
 - Contours
 - Images
 - Orthoimage



Layers Options ▾

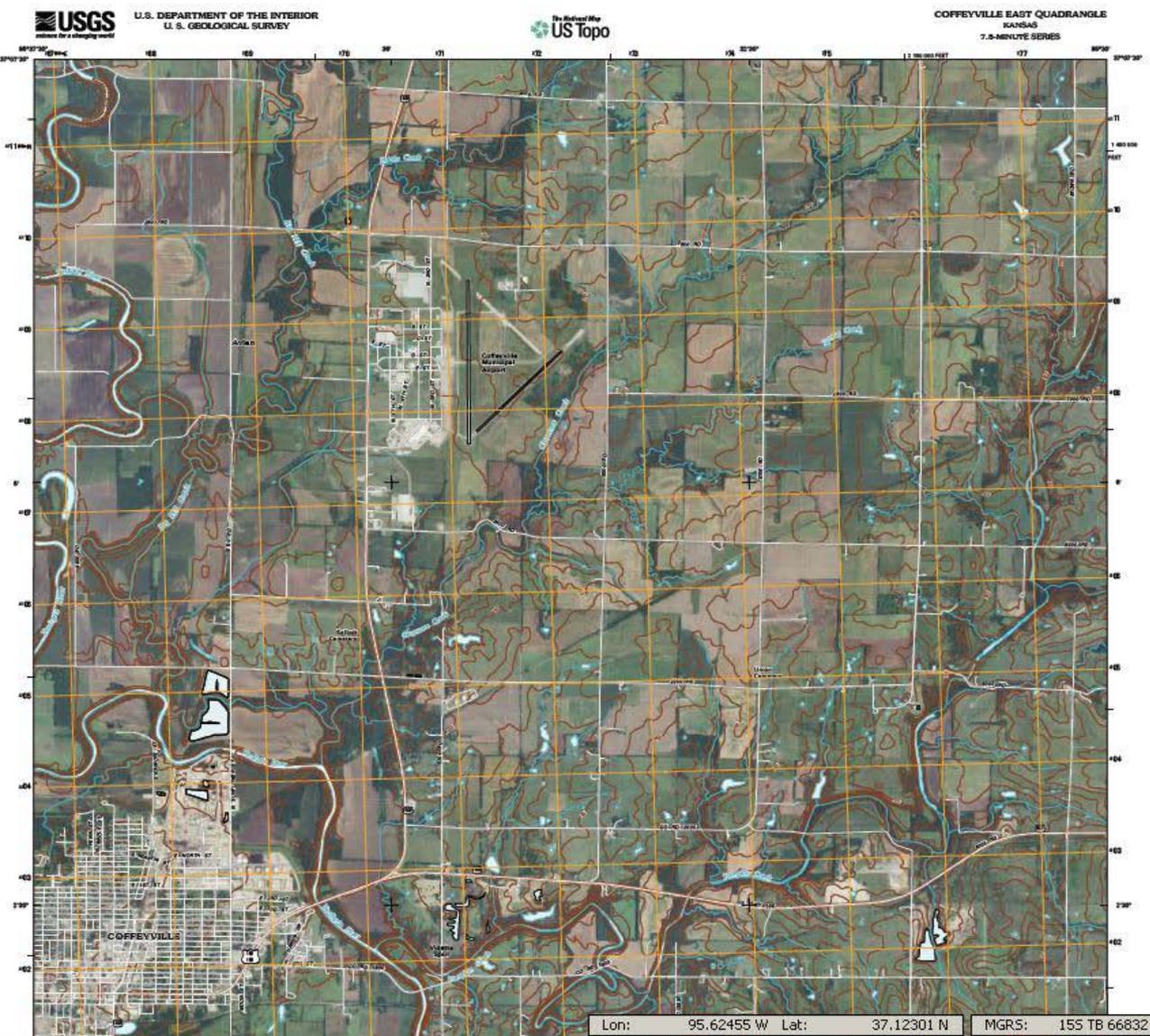
- Map Collar
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 - Roads
 - Airport Names
 - Airports
- Hydrography
- Contours
- Images
- Orthoimage



GeoTool - Locks/Unlocks Coordinates, Google™ Map It and Launches Other GeoPDF Tools.

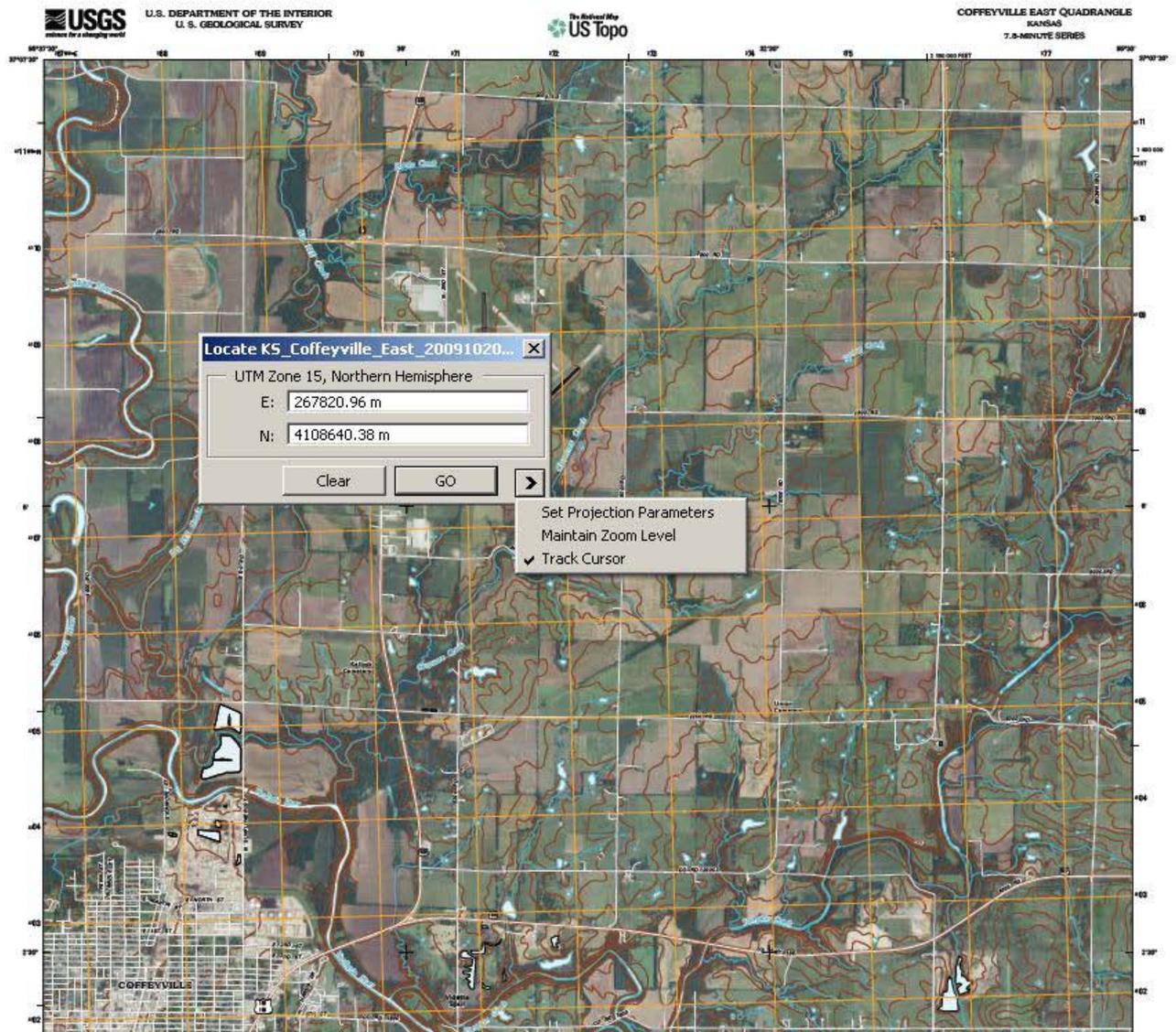
Layers

- Map Collar
- Map Elements
- Map Frame
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 - Airports
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- Contours
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- Orthoimage



Layers Options

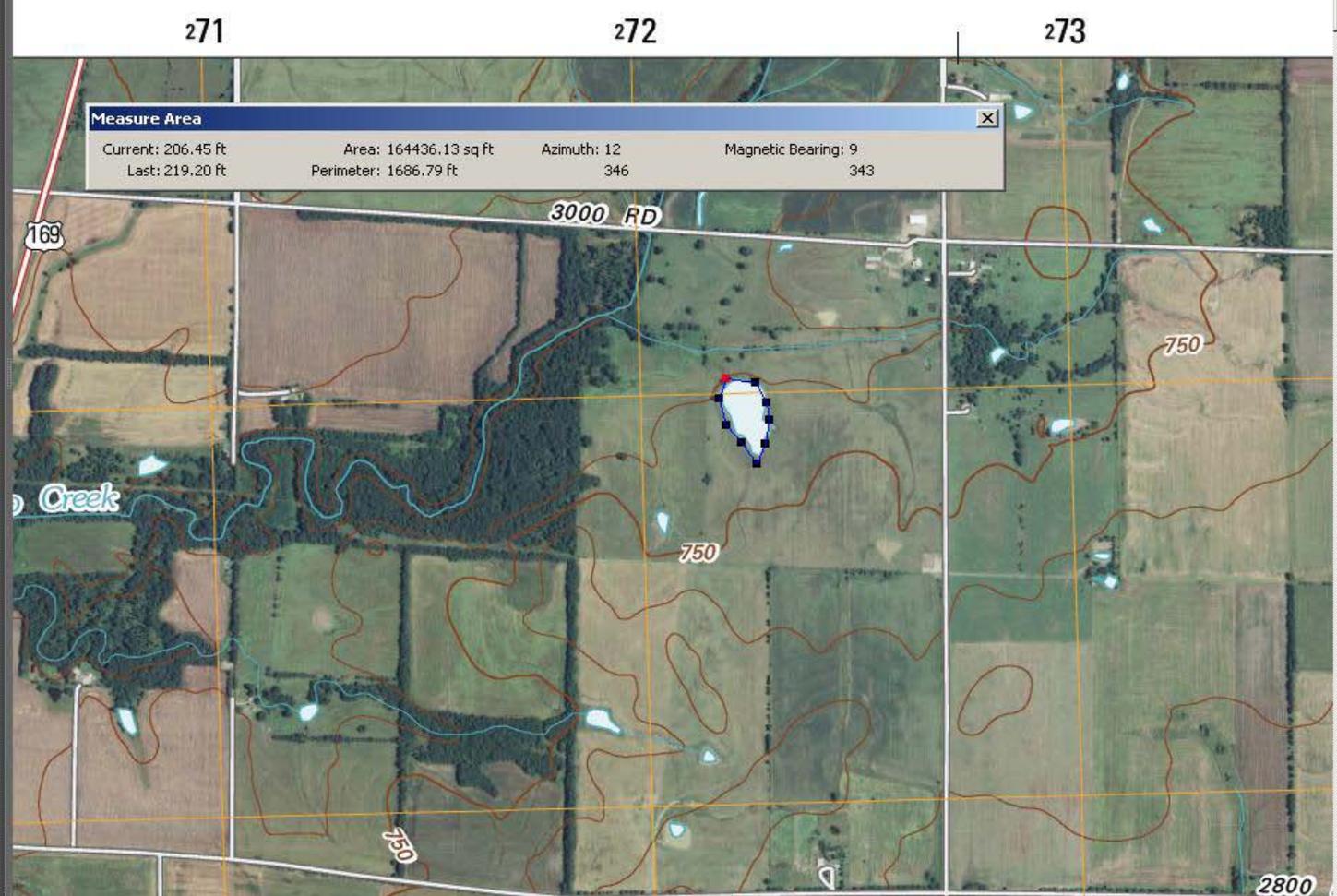
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Layers Options

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The National Map
US Topo



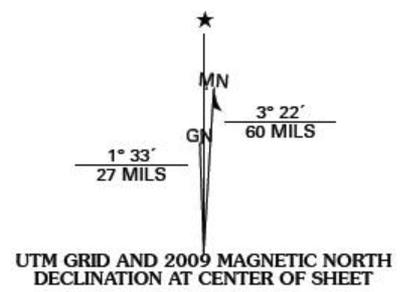
Layers Options

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Produced by the United States Geological Survey
 North American Datum of 1983 (NAD83)
 World Geodetic System of 1984 (WGS84). Projection and
 1 000-meter grid: Universal Transverse Mercator, Zone 15S
 10 000-foot ticks: Kansas Coordinate System of 1983
 (south zone)
 and Oklahoma Coordinate System of 1983
 (north zone)

Imagery.....NAIP, July 2008
Roads.....National Transportation Dataset, 2006
Names.....GNIS, 2008
Hydrography.....National Hydrography Dataset, 2008
Contours.....National Elevation Dataset, 2005



U.S. National Grid	
100,000-m Square ID	
TB	41 00
TA	
Grid Zone Designation	
15S	

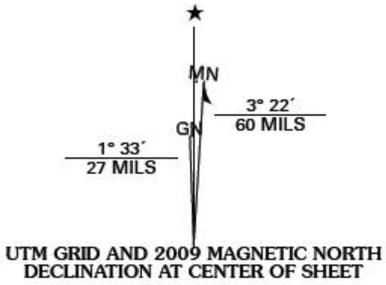
Layers Options

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U.S. National Grid	
100,000-m Square ID	
TB	41 00
TA	
Grid Zone Designation	
15S	

Lon: 95.60579 W Lat: 37.00561 N MGRS: 15S TA 68142 98670

21.75 x 29.00 in

Name	Description	Modified	Size
metadata.xml	Metadata for the map	10/20/2009 12:00:00 AM	47 KB

Coffeyville_East_20091020_OM_geo.pdf - Adobe Reader
File Edit View Document Tools TerraGo Window Help
1 / 1 133% Find

US Topo 7.5-minute map for Coffeyville East, KS - Windows Internet Explorer
E:\wintemp\AcrAB0B.tmp\metadata.xml Live Search
US Topo 7.5-minute map for Coffeyville East, KS

US Topo 7.5-minute map for Coffeyville East, KS

[FGDC Metadata](#)

[Show Definitions](#)

[Description](#) | [Spatial](#) | [Data Structure](#) | [Data Quality](#) | [Data Source](#) | [Metadata](#)

Description

Citation

Title: US Topo 7.5-minute map for Coffeyville East, KS

Originators: U.S. Geological Survey

Publisher: USGS - National Geospatial Technical Operations Center (NGTOC)

Publication place: Rolla, MO and Denver, CO

Publication date: 20091020

Data type: map, raster digital data

Description

Data Type

Time Period of Data

Status

Key Words

Data Access Constraints

Spatial Reference Information

Horizontal Coordinate System

Coordinate System Details

Grid coordinate system

Grid coordinate system name: Universal Transverse Mercator

Universal Transverse Mercator:

UTM zone number: 15

Transverse Mercator:

Scale factor at central meridian: 0.9996

Longitude of central meridian: -93

Latitude of projection origin: 0.0

False easting: 500000

False northing: 0.0

Planar Coordinate Information

Planar coordinate encoding method: coordinate pair

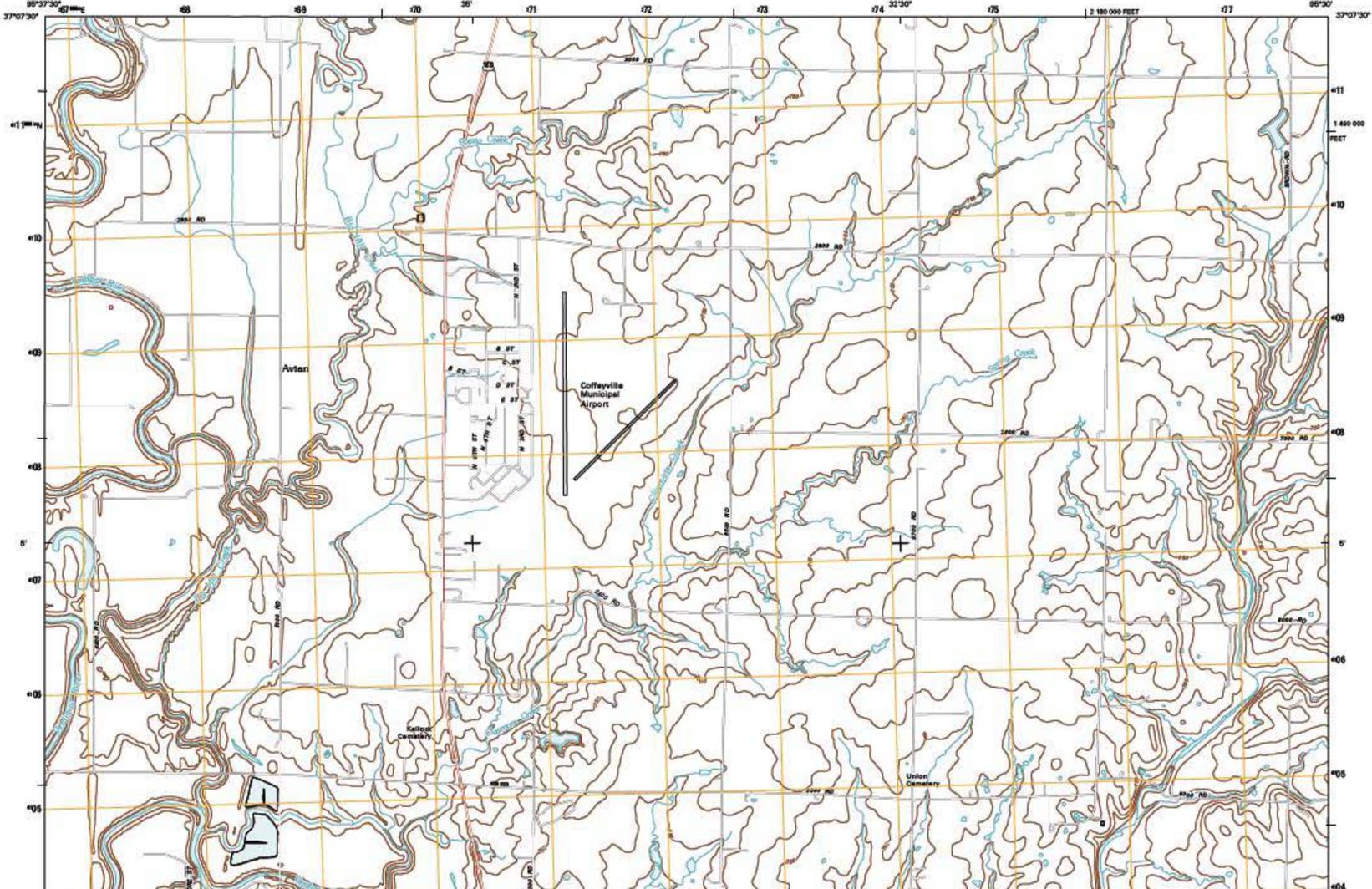
Coordinate representation:



U.S. DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY



COFFEYVILLE EAST QUADRANGLE
KANSAS
7.5-MINUTE SERIES



US Topo - Windows Internet Explorer

http://nationalmap.er.usgs.gov/ustopo/

USGS science for a changing world

The National Map US Topo

USGS Home Contact USGS Search USGS

The National Map

About US Topo Maps

Download Maps (Map Store)

Frequently Asked Questions

User's Guide-Quickstart (1.4 MB pdf)

Information Sheet (5 MB pdf)

Brochure (5 MB pdf)

History of USGS Topographic Maps

The National Map

Contact Us

A New Generation of Maps



US Topo is the next generation of digital topographic maps from the [U.S. Geological Survey](#). Arranged in the [traditional 7.5-minute quadrangle](#) format, digital US Topo maps are designed to look and feel like the traditional paper topographic maps for which the USGS is so well known. At the same time, US Topo maps provide modern technical advantages that support wider and faster public distribution and enable basic, on-screen geographic analysis for all users.

US Topo maps are available free on the Web. Each map quadrangle is constructed in GeoPDF® format from key layers of geographic data - [orthoimagery](#), [roads](#), [geographic names](#), [contours](#) and [hydrographic](#) features - found in [The National Map](#), which is a nationwide collection of integrated data from local, State, Federal, and other sources.

US Topo [users](#) can turn geographic data layers on and off as needed; zoom in and out to highlight specific features or see a broader context; and print the maps, in their entirety or in customized sections, on a wide variety of printing devices. Additional analytical tools are available free for [download](#). File size for each digital 7.5-minute quadrangle is about 15-20 megabytes.

The prototype of US Topo, "Digital Map-Beta," has been available since June 2009 and currently covers 17 states. US Topo maps include all of the content of the earlier "Digital Map-Beta," plus integrated [contours](#) and [hydrographic](#) features.

As the US Topo product evolves, the USGS will provide digital versions of earlier edition topographic quadrangle maps and will incorporate additional geographic data layers from [The National Map](#).

The USGS values your [comments and suggestions](#) about the new US Topo.

Coverage

[See current US Topo map coverage.](#)

As of October 2009, the USGS began to load US Topo maps to the [USGS Store](#) distribution point where the maps will be available for free download. Existing "Digital Map-Beta," will continue to be available for free download. As available, they will be eventually replaced by revised and enhanced US Topos produced by the USGS [National Geospatial Technical Operations Center](#).

What Makes the USGS US Topo Different from Other Electronic Maps?

enlarge

Coffeyville East Kansas
[Coffeyville Quad with image turned off](#)
[Download the full Coffeyville East Kansas Geo PDF \(16 MB\)](#)

Start | US Topo - IBM Lotus Notes | Craun_12_3_09 | Craun_10_29_09 | US Topo - Windows In... | Internet | 100% | 7:03 AM

Linked to <http://nationalmap.gov>



The New National Map Viewer

The New *National Map Viewer*

Viewer Features:

- **100% *The National Map* Content**
 - Cached Base Map Service built from *The National Map* data
 - Content will improve/evolve with *The National Map* data
- **One stop to download *The National Map* data and view services**
- **Direct access to US Topo Maps**
- **Advanced Features**
 - GIS Toolbox
 - User-added content
 - Transparency settings
 - Ability to e-mail link and bookmark views



Find a Place
e.g., Phoenix, AZ or -115.14 36.17

Options Help
Link

Overlays GIS Toolbox Base Map **Topo/Shaded** Imagery Imagery/Hybrid Tasks / Results

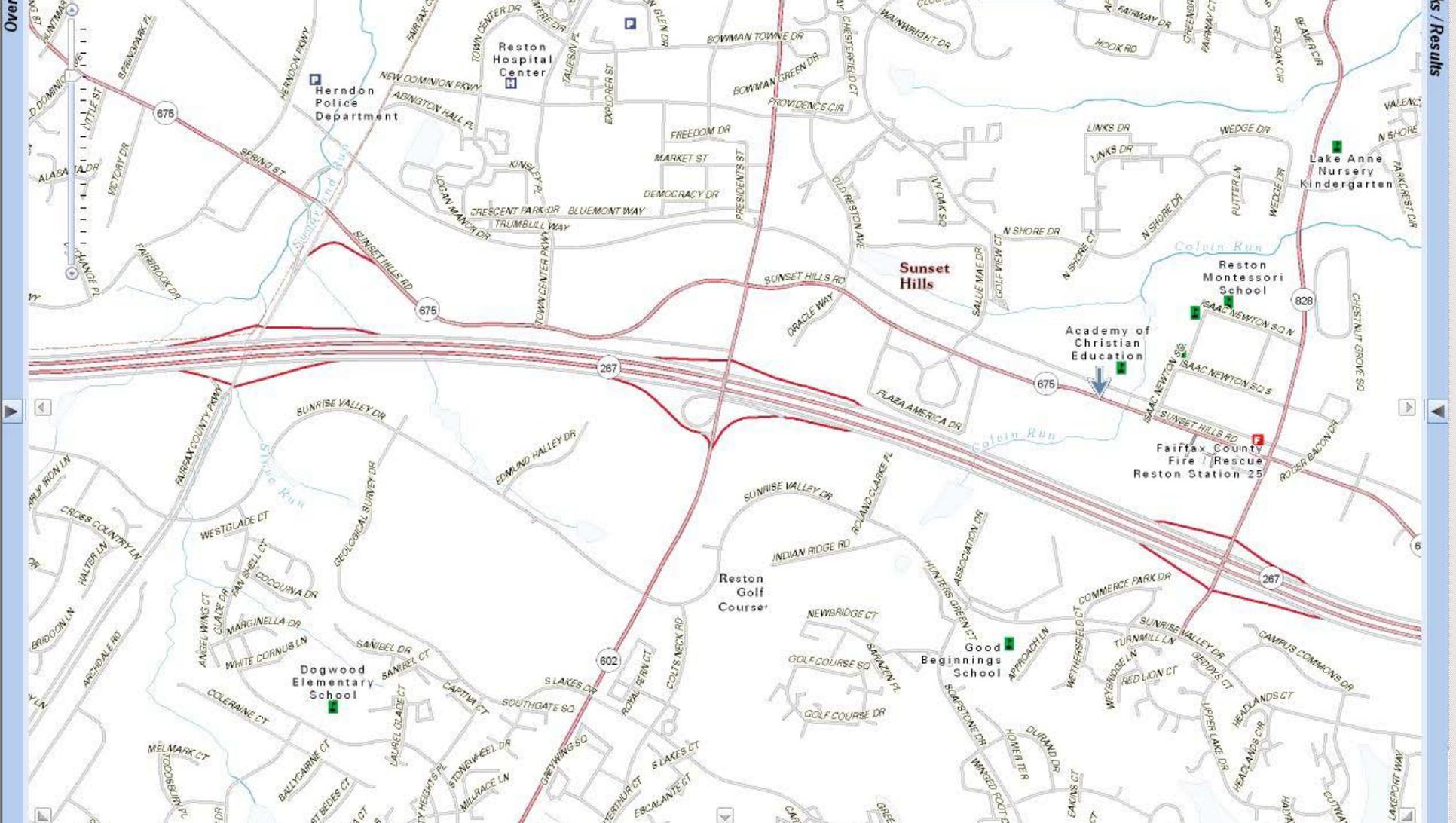




Find a Place
Reston, VA
e.g., Phoenix, AZ or -115.14 36.17

Options Help
Link

Overlays GIS Toolbox Base Map **Topo/Shaded Imagery** Imagery/Hybrid Tasks / Results

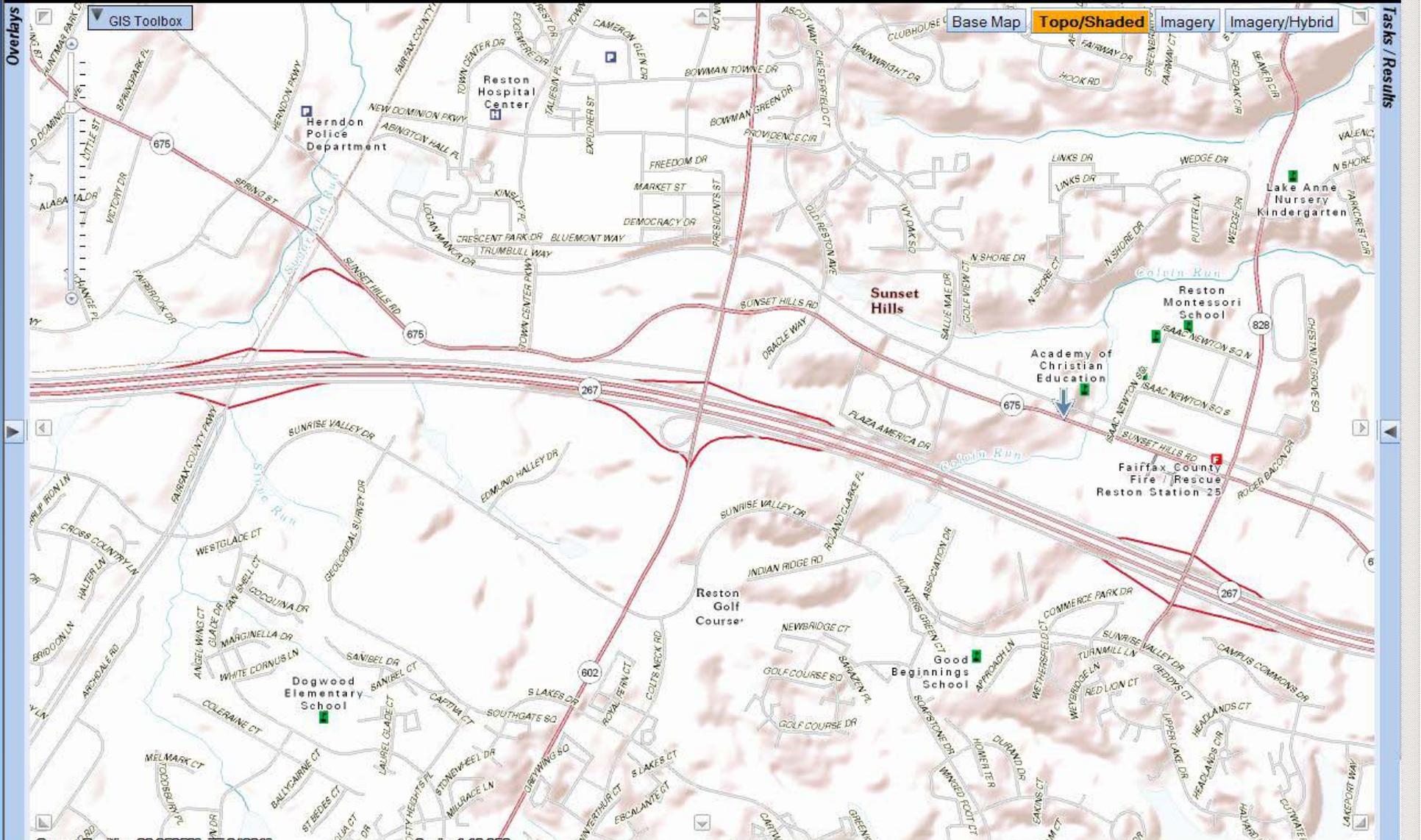




Find a Place
Reston, VA
e.g., Phoenix, AZ or -115.14 36.17
Search

Options Help

Link



Overlays

GIS Toolbox

Base Map **Topo/Shaded** Imagery Imagery/Hybrid

Tasks/Results

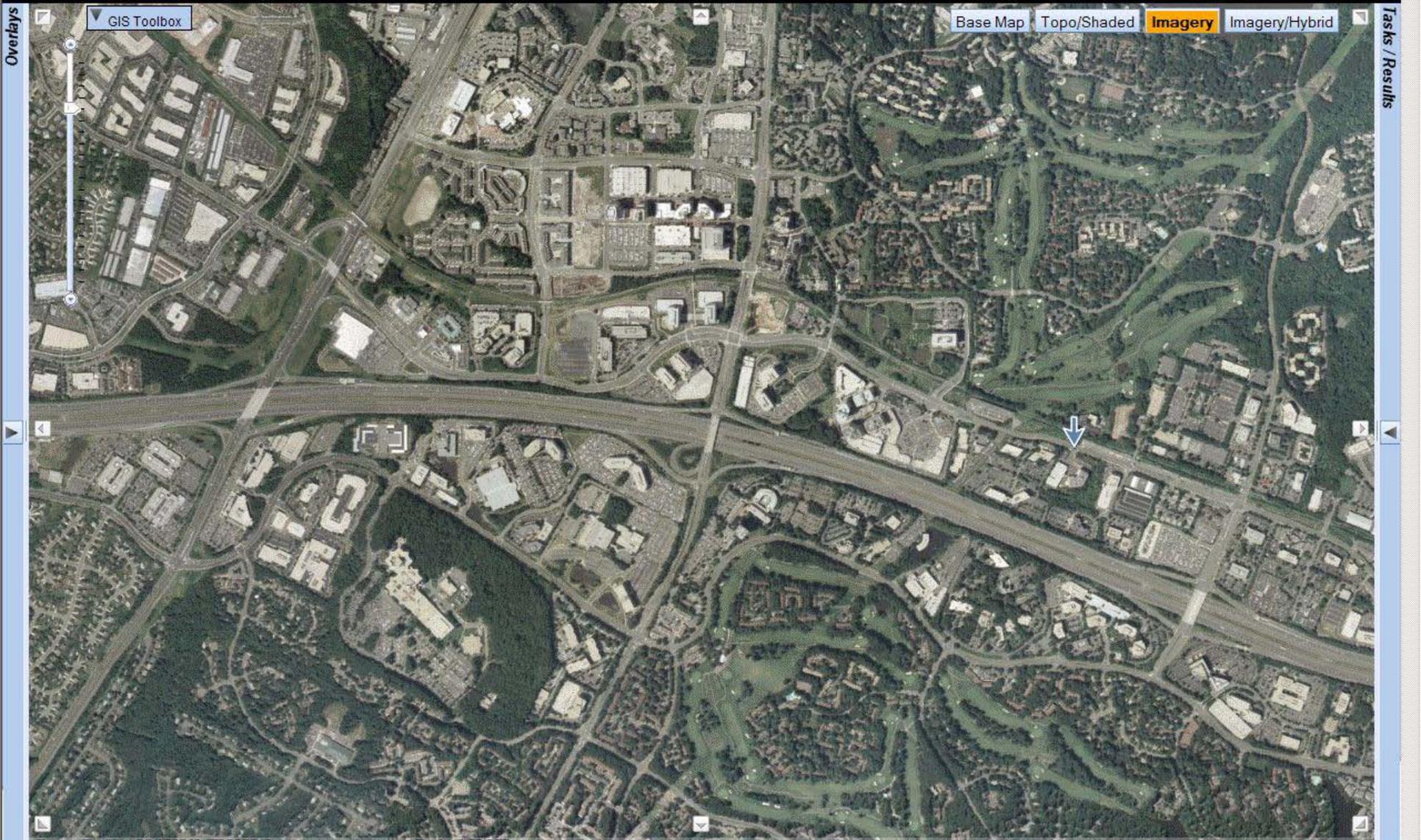
Cursor Position 38.95553° -77.34881°

Scale 1:18,056



Find a Place
Reston, VA
e.g., Phoenix, AZ or -115.14 36.17

Options Help
Link



GIS Toolbox

Base Map Topo/Shaded **Imagery** Imagery/Hybrid

Overlays

Tasks / Results

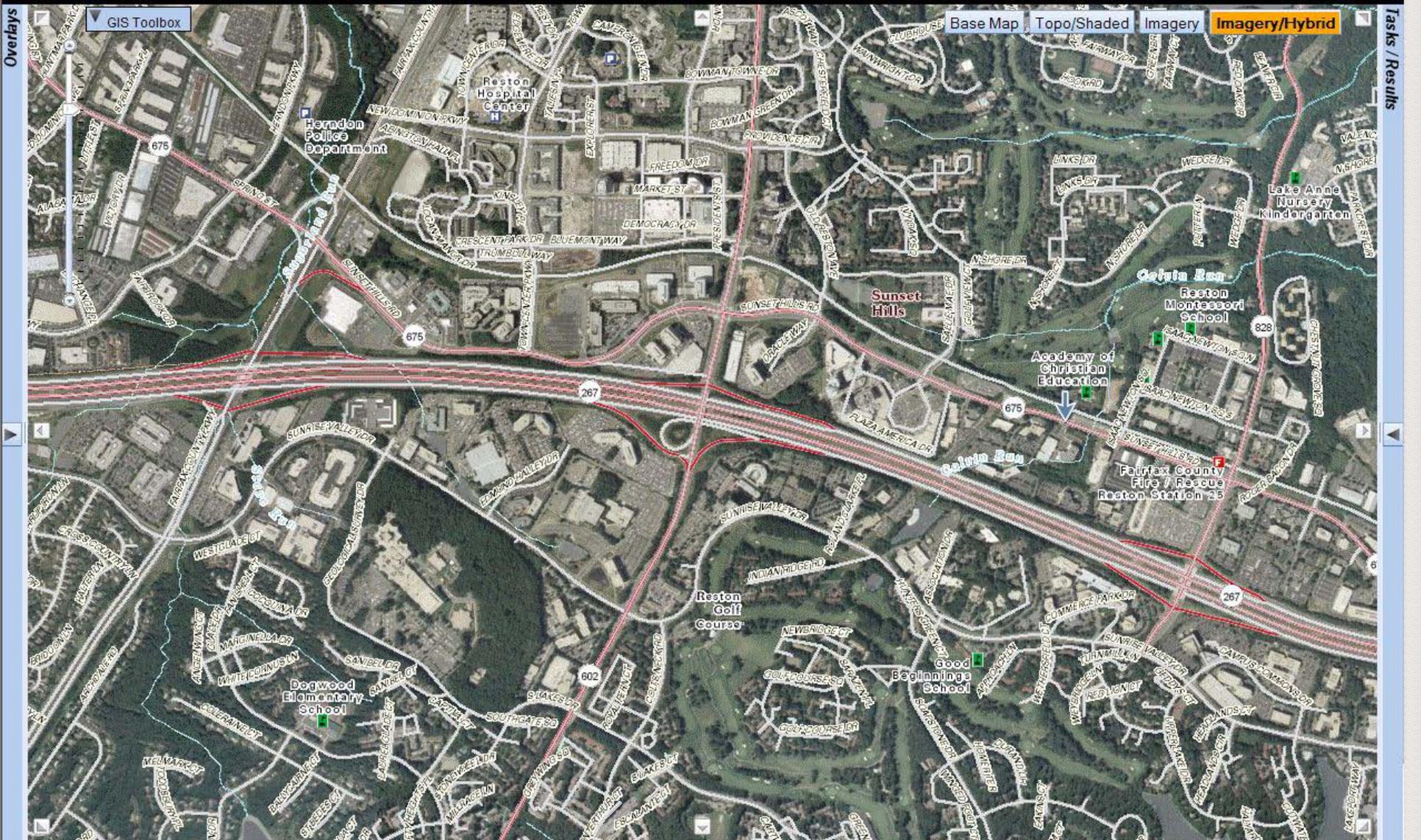


The National Map Viewer

BETA
Powered by Palantir™ x3

Find a Place
Reston, VA
Search
e.g., Phoenix, AZ or -115.14 36.17

Options Help
Link



Overlays

GIS Toolbox

Base Map | Topo/Shaded | Imagery | **Imagery/Hybrid**

Tasks / Results

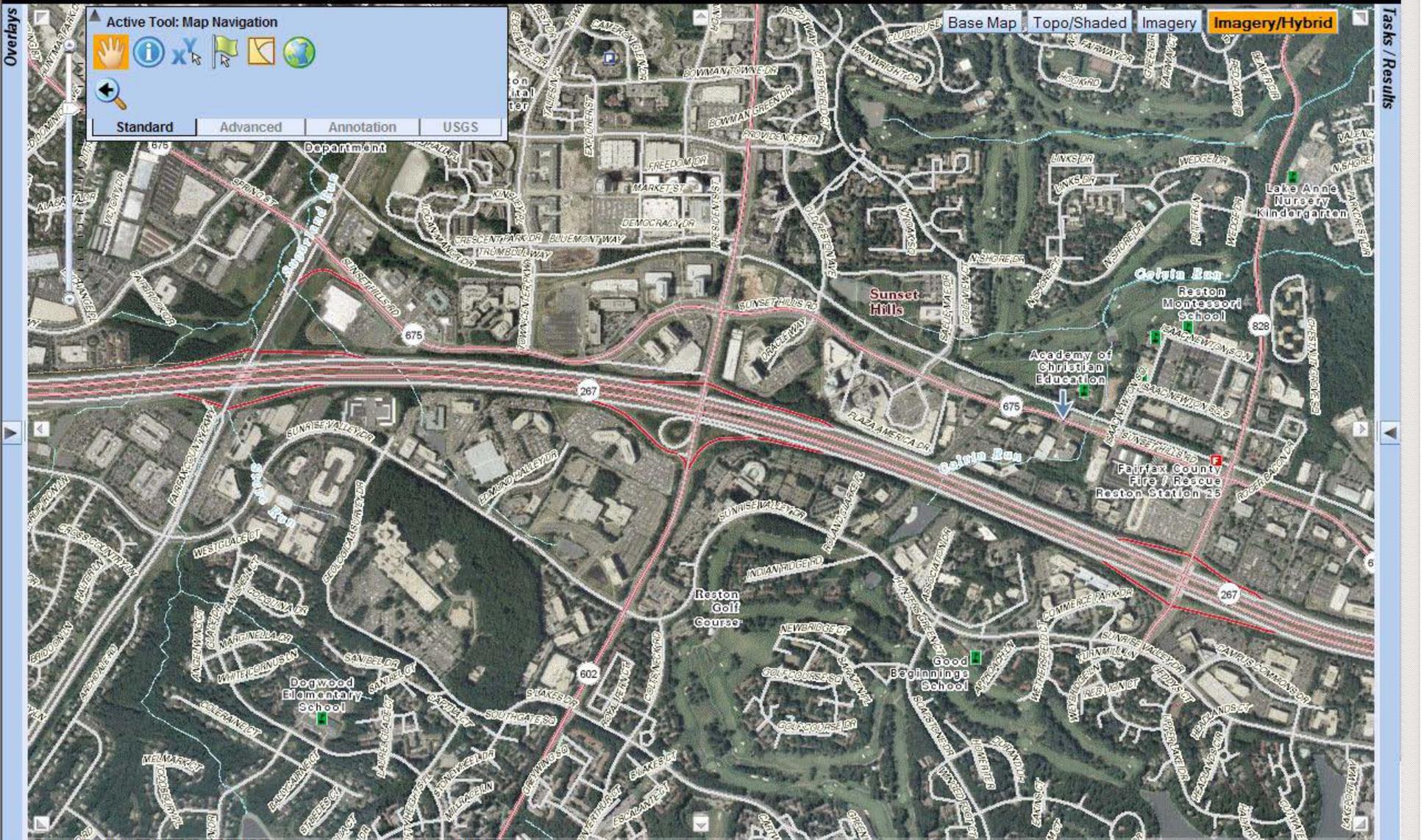
Find a Place
Reston, VA
e.g., Phoenix, AZ or -115.14 36.17
Search

Overlays

Active Tool: Map Navigation

Standard Advanced Annotation USGS

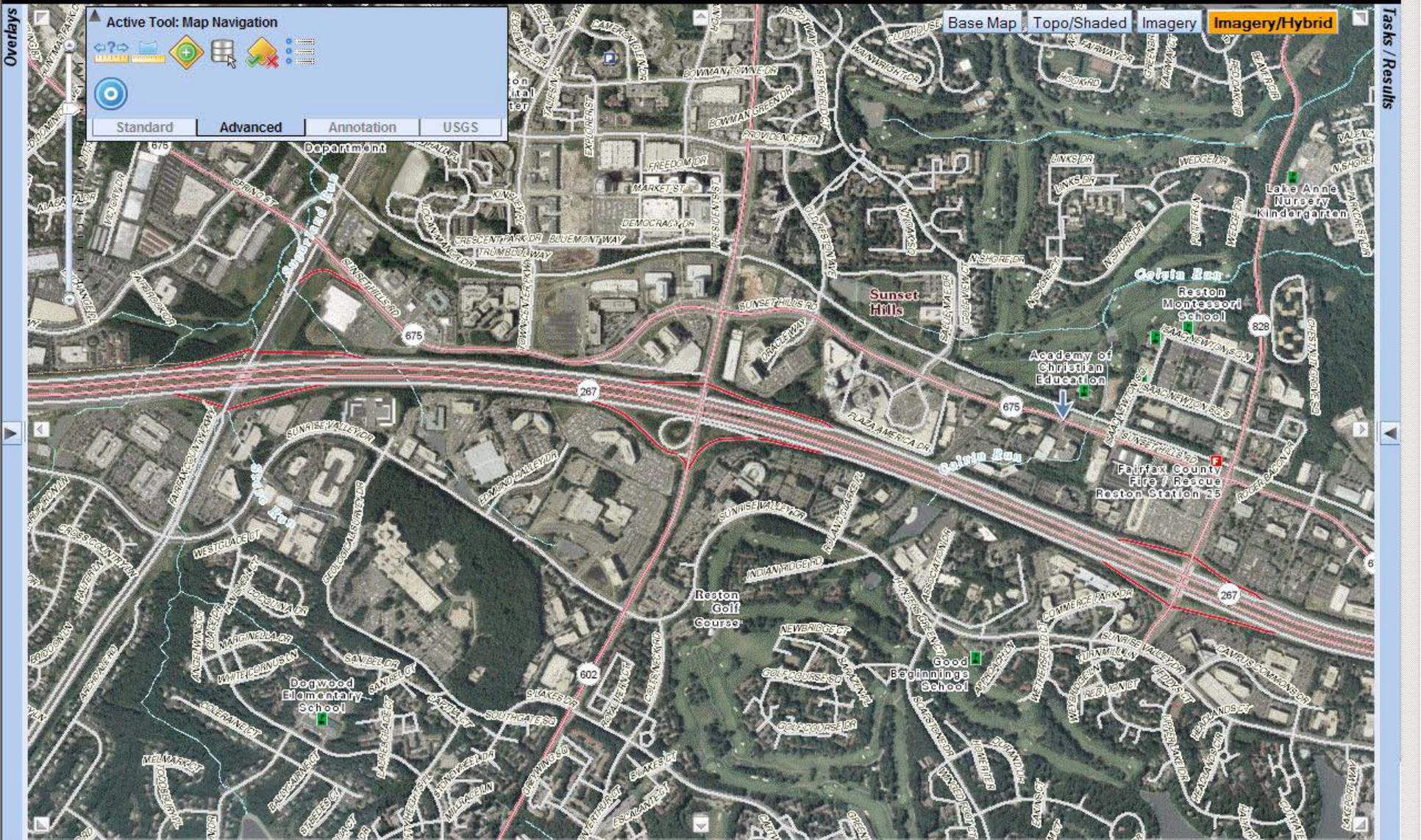
Base Map | **Topo/Shaded** | Imagery | **Imagery/Hybrid**





Find a Place
Reston, VA
e.g., Phoenix, AZ or -115.14 36.17

Options Help
Link



Overlays

Tasks / Results

Find a Place
Reston, VA Search
e.g., Phoenix, AZ or -115.14 36.17

Overlays

Active Tool: Reverse Geocode

Standard Advanced Annotation USGS



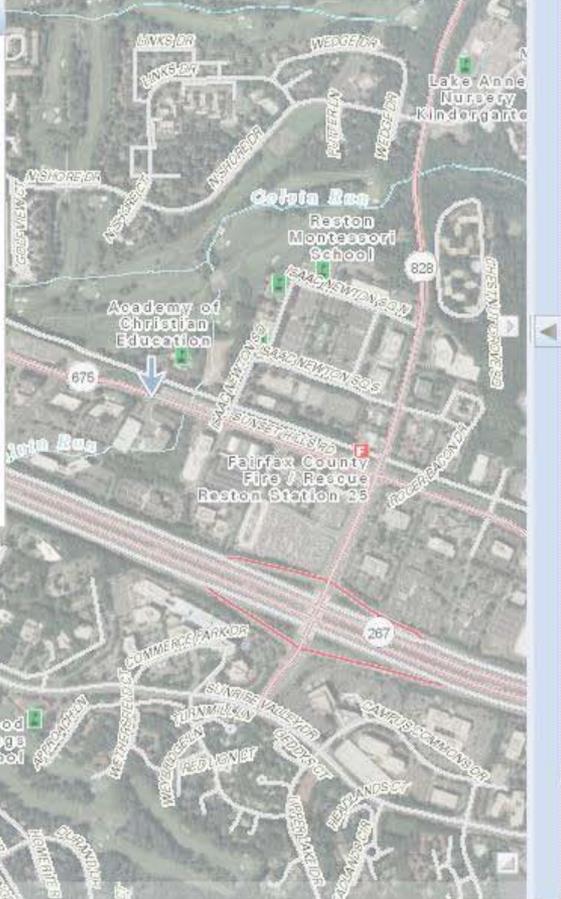
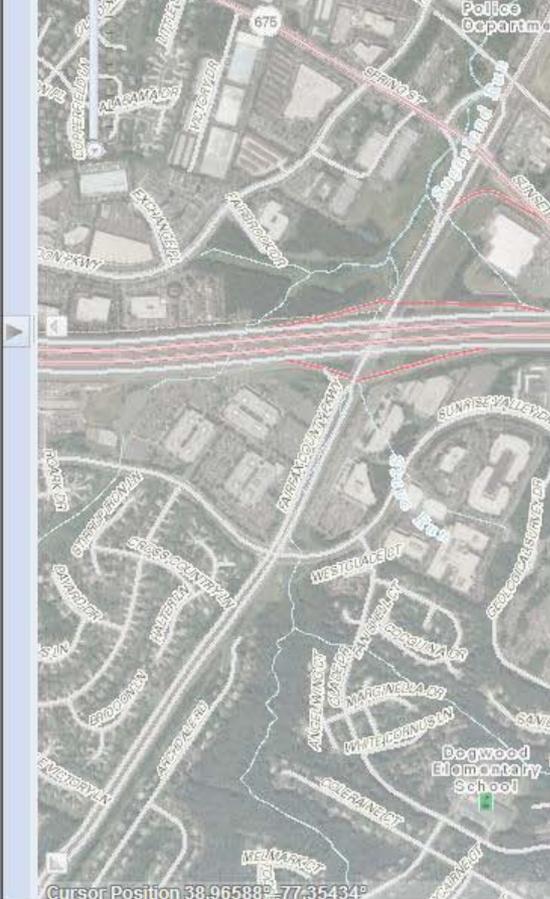
Add Data

Upload or Connect to KML File
Add KML data or a GeoRSS feed by either providing a network link (url) or browse for a kml or kmz file.

Filename or URL:
 File URL
 Browse...

Open

- AGS
- KML RSS
- WMS
- IMS



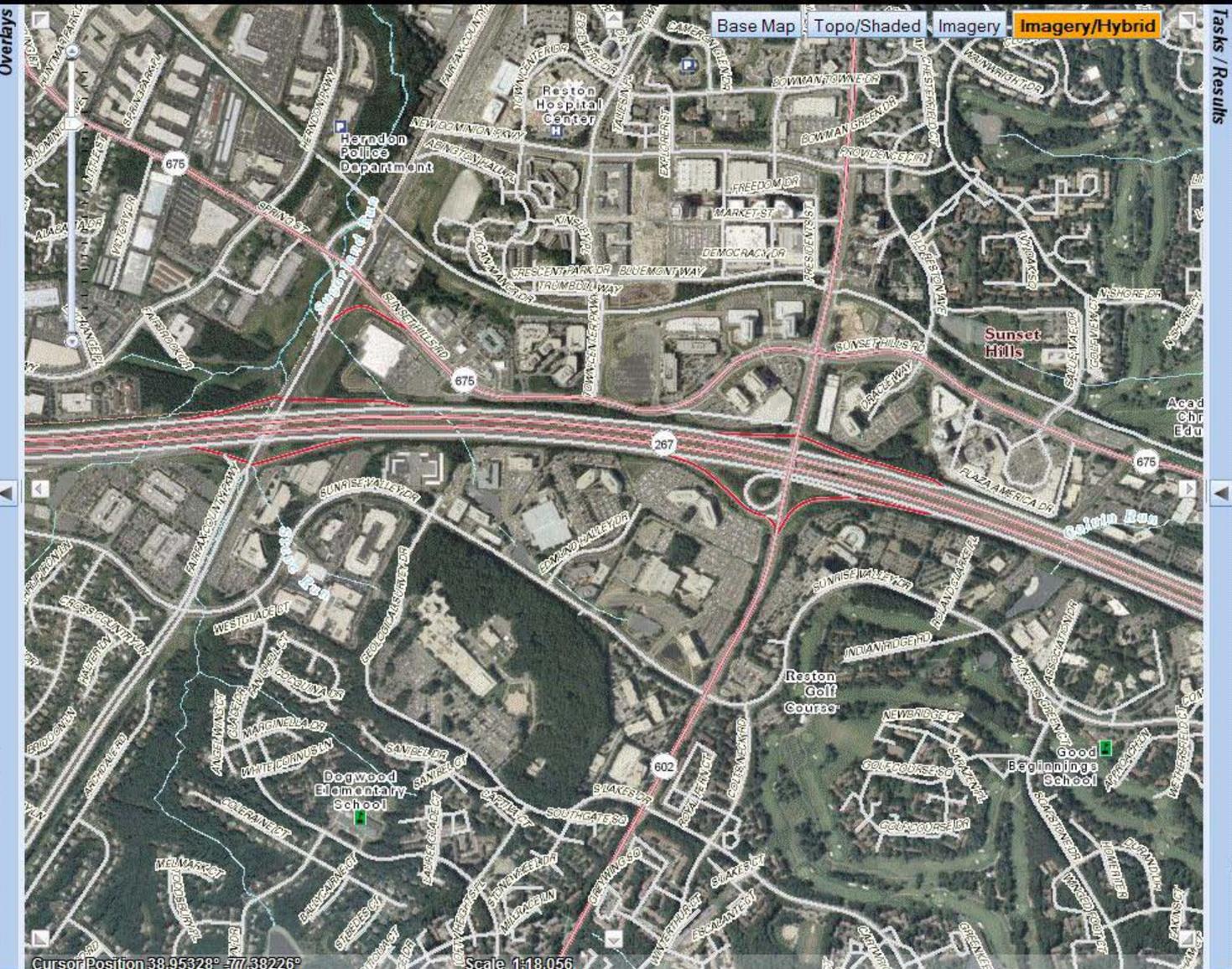
Find a Place
Reston, VA
e.g., Phoenix, AZ or -115.14 36.17

Base Data GIS Toolbox

- US Topo: Current Available
- Geographic Names (GNIS)
- Structures
- Transportation**
 - Airport
 - Airport Labels
 - Interstate
 - Interstate labels
 - US Route
 - US Route labels
 - State Route
 - State Route labels
 - County Route
 - County Route labels
 - Local Road
 - Local Road labels
- Governmental Units
- Hydrography (NHD)
- Land Cover (NLCD)
- Contours (Beta)
- Large Scale Shaded Relief
- Large Scale Imagery
- Scanned Map (Beta)

Download Selectable Polygons
Inventory Services
Emergency Operations
Featured Federal Services
User Added Content

Content Reorder Layers



Overlays

Tasks / Results

Find a Place
Coffeyville, KS Search
e.g., Phoenix, AZ or -115.14 36.17

Base Data GIS Toolbox

Download Selectable Polygons

Inventory Services

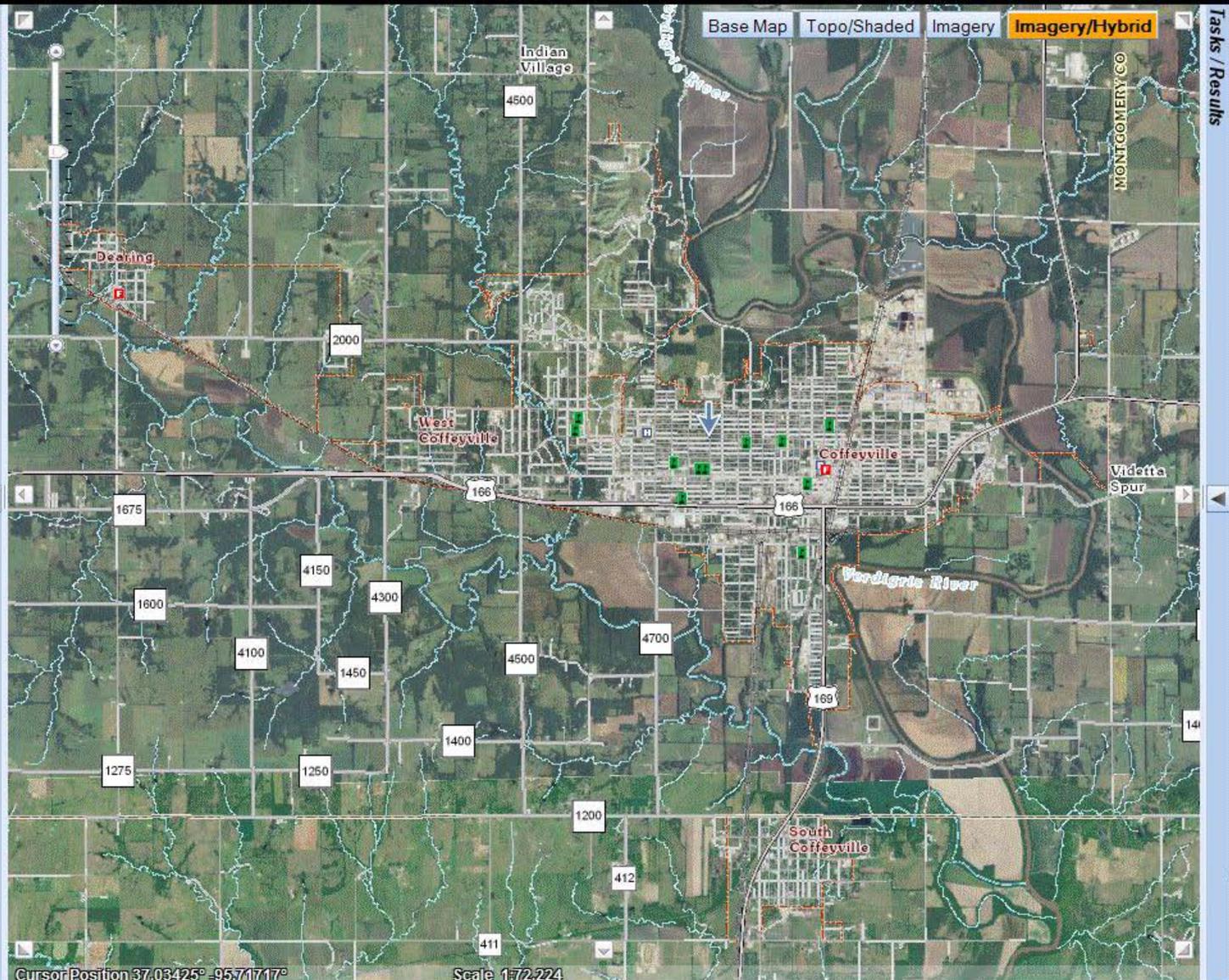
- US Topo: Current Available
- Structures - Fire and EMS Stations by Co
- Structures - Hospitals and Medical Cent
- Structures - Law Enforcement Facilities
- Structures - Schools by county
- Transportation, Roads - Census Loads
- Transportation, Roads - Lower Census
- Transportation, Roads - Upper Census
- NHD High Resolution - Vintage by Quad
- NHD High Resolution - Subbasin Revisi
- NHD High Resolution - Subregion Maint
- NHD Medium Resolution - Subbasin 10
- NAIP Imagery - Vintage Date Range, Low
- NAIP Imagery - Lower date range (year)
- NAIP Imagery - Multiple Images Per Qua
- NAIP Imagery - Vintage Date Range, Up
- NAIP Imagery - Upper date range (year)

Emergency Operations

Featured Federal Services

User Added Content

Content Reorder Layers



Tasks / Results

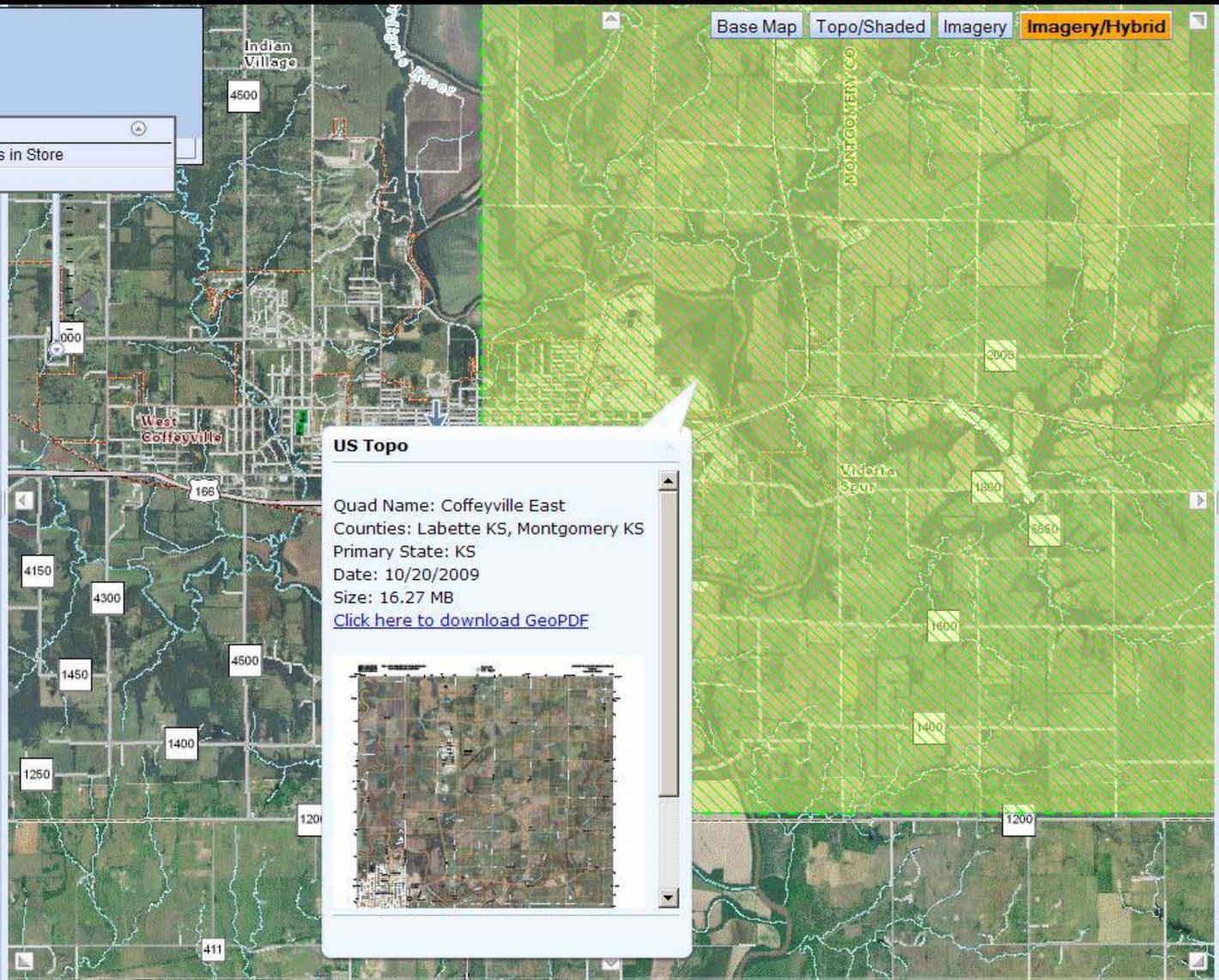
Find a Place
Coffeyville, KS
e.g., Phoenix, AZ or -115.14 36.17
Search

Base Data
Download
Inventory

Active Tool: Identify

- Layers to Identify
- US Topo: Current Available: GeoPDFs in Store
[Refresh](#) | [Select All](#) | [Deselect All](#)
 - Structures - Law Enforcement Facilities
 - Structures - Schools by county
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 - NAIP Imagery - Multiple Images Per Qua
 - NAIP Imagery - Vintage Date Range, Up
 - NAIP Imagery - Upper date range (year)

Base Map | Topo/Shaded | Imagery | **Imagery/Hybrid**



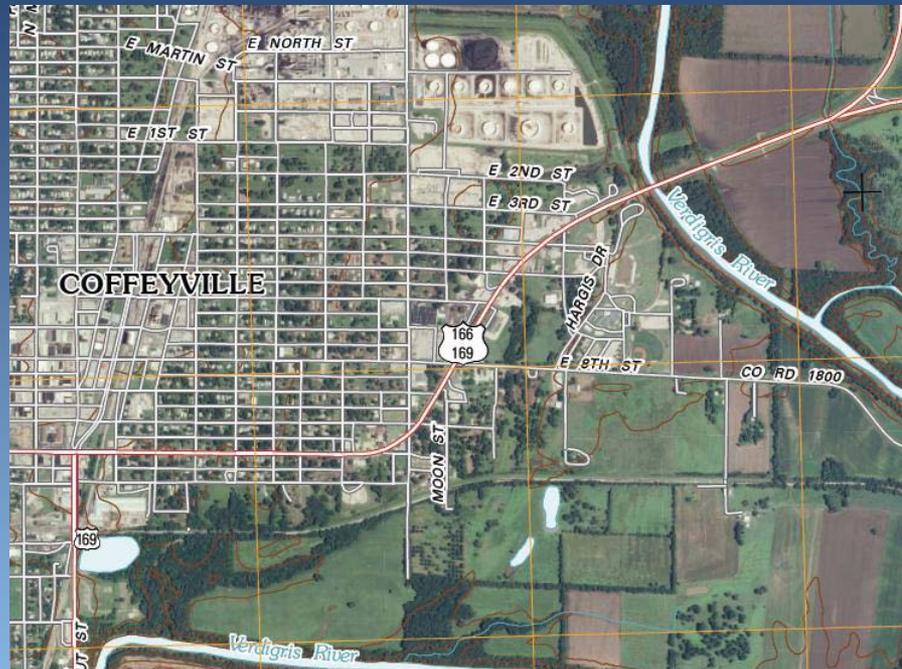
US Topo

Quad Name: Coffeyville East
Counties: Labette KS, Montgomery KS
Primary State: KS
Date: 10/20/2009
Size: 16.27 MB
[Click here to download GeoPDF](#)

Emergency Operations
Featured Federal Services
User Added Content

Content Reorder Layers

Building on Success: 125 Years of Topographic Mapping



1880s Field sketching



1940s Mapping from stereophotography



1970s Electronic instrumentation



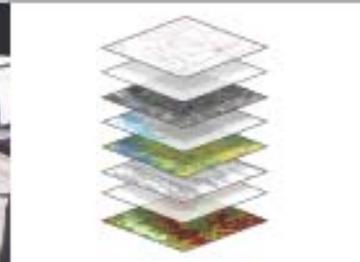
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1990s Mapping with computers



2000s Mapping with the Internet





Thank You

<http://nationalmap.gov>

kcraun@usgs.gov