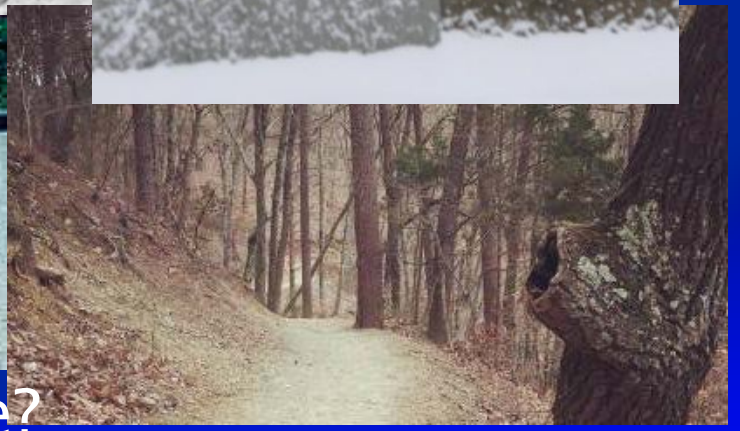
Introduction to LOJIC Digital Mapping

www.lojic.org

Geography: Why Do We Care?

Geography is fundamental to almost everything we do in government service

- Where is **it**?
- How can I get to **it**?
- What's near **it**?
- What's affected by **it**?
- What can I build on **it**?
- What services are available there?



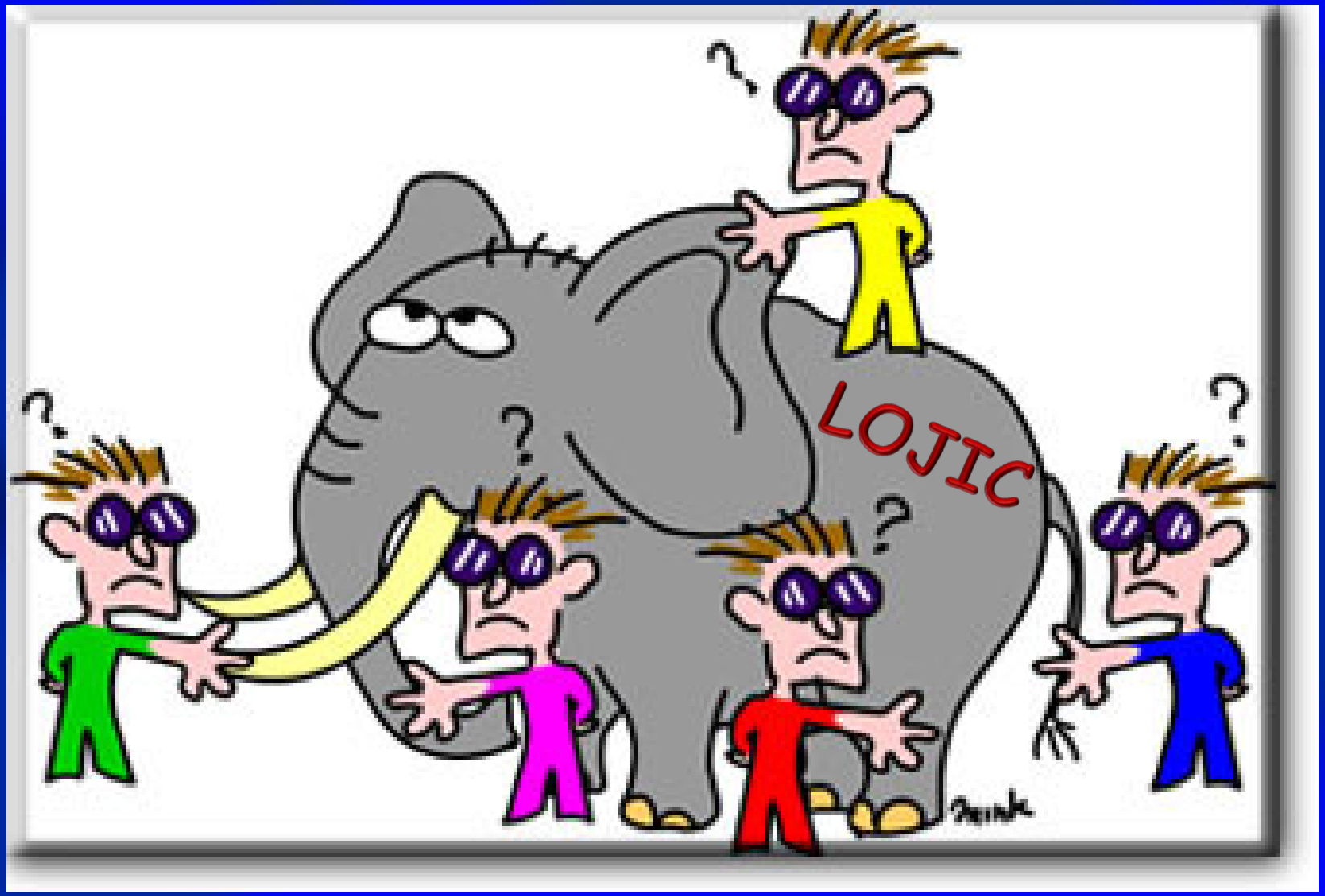
Credit: David Arbeit, State of Minnesota

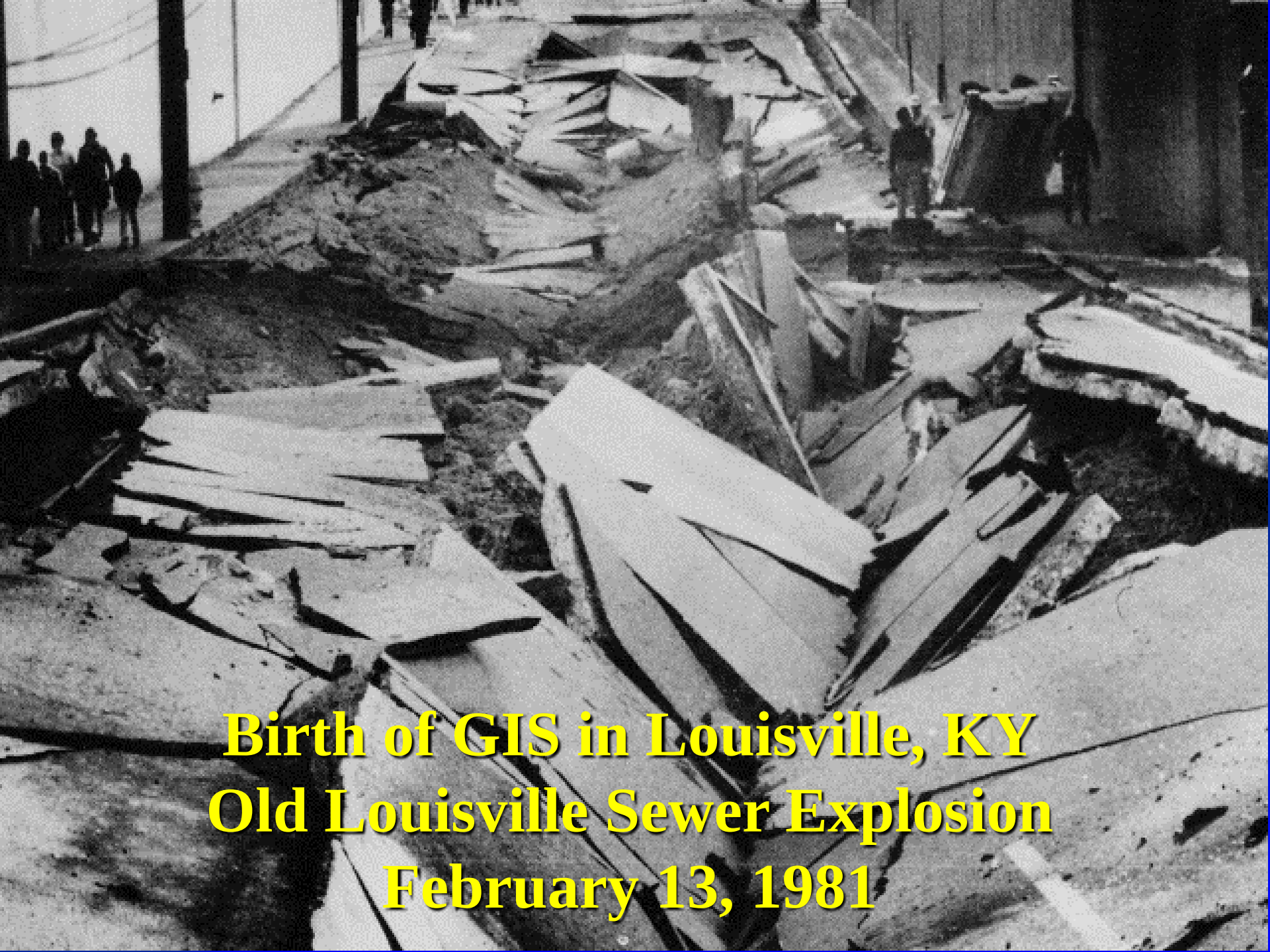
Geographic Information Systems: Why We Need Them

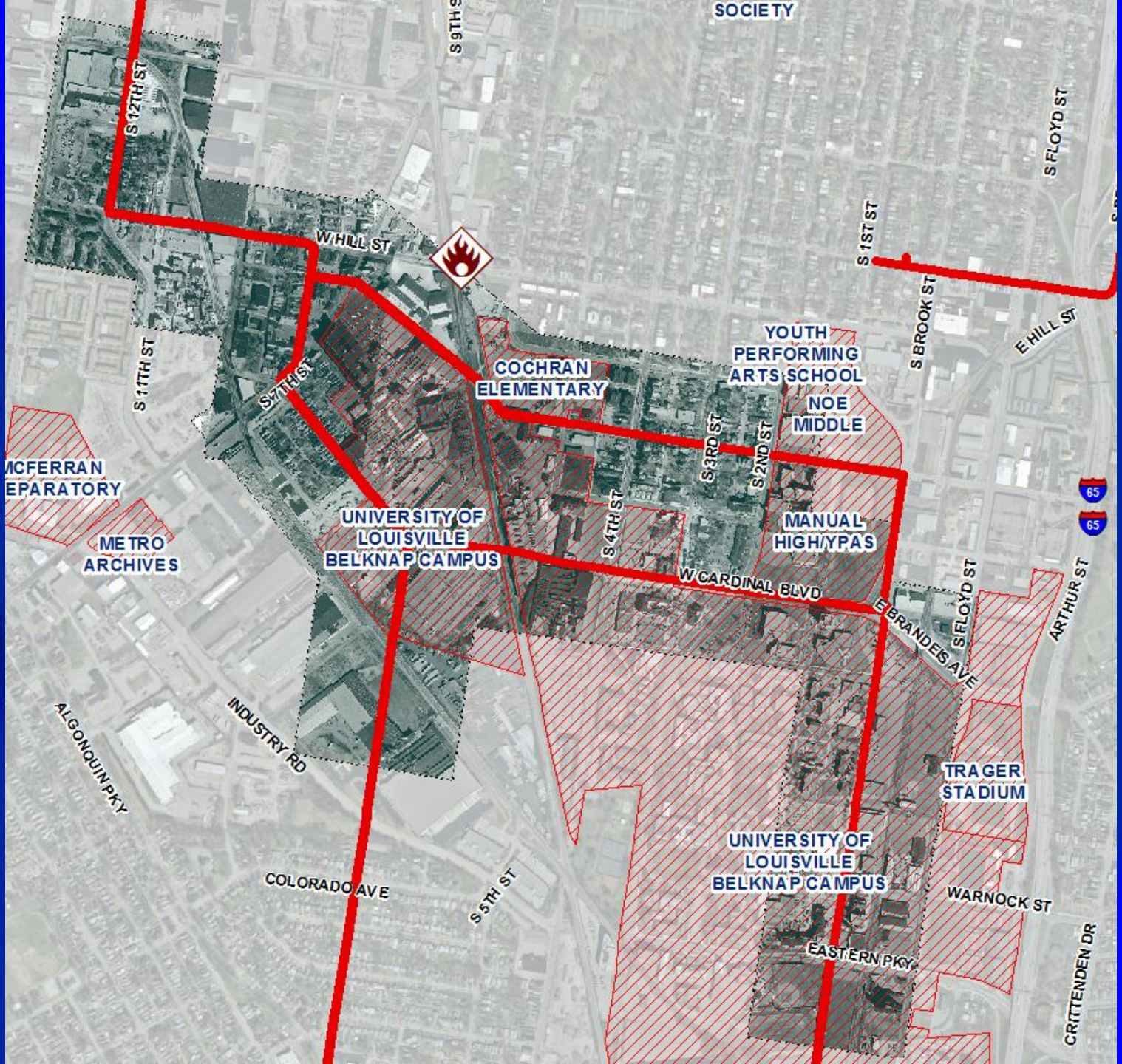
- Collect and store data
- Analyze complex relationships
- Produce new information
- Increase knowledge and understanding
- *Solve complex problems at a level of detail that was not previously possible*

Credit: David Arbeit, State of Minnesota

What is LOJIC and Why was it created?




Birth of GIS in Louisville, KY
Old Louisville Sewer Explosion
February 13, 1981


SOCIETY
S 9TH ST
S 12TH ST
S FLOYD ST
S 1ST ST
W HILL ST
S BROOK ST
E HILL ST
S 11TH ST
S 7TH ST
COCHRAN ELEMENTARY
YOUTH PERFORMING ARTS SCHOOL
NOE MIDDLE
S 3RD ST
S 2ND ST
MCFERRAN EPARATORY
UNIVERSITY OF LOUISVILLE BELKNAP CAMPUS
S 4TH ST
MANUAL HIGH/YPAS
65
65
METRO ARCHIVES
W CARDINAL BLVD
E BRANDEIS AVE
S FLOYD ST
ARTHUR ST
ALGONQUIN PKY
INDUSTRY RD
TRAGER STADIUM
UNIVERSITY OF LOUISVILLE BELKNAP CAMPUS
COLORADO AVE
S 5TH ST
WARNOCK ST
EASTERN PKY
CRITTENDEN DR

LOJIC Participants

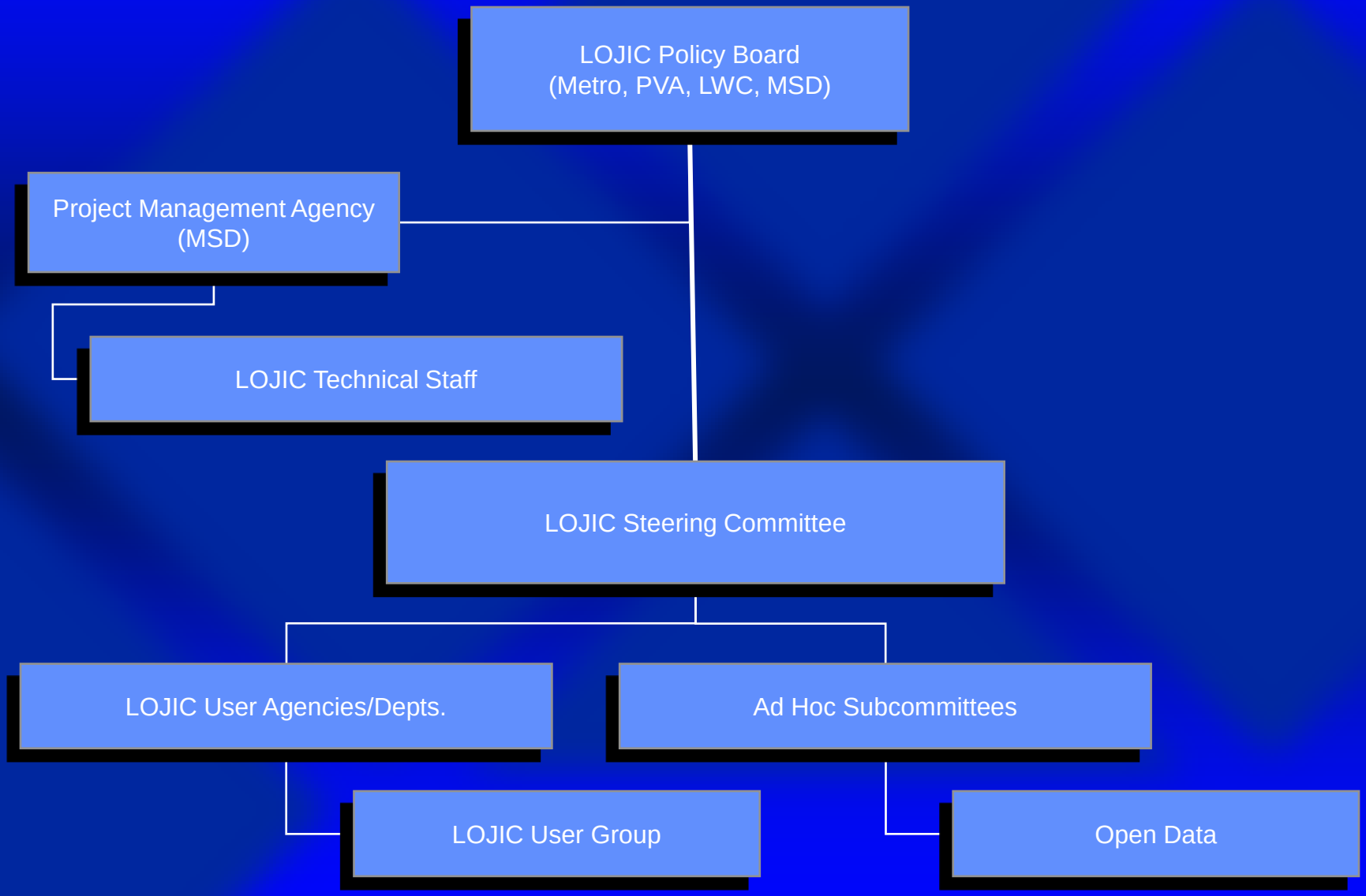
Metropolitan Sewer District

Property Valuation Administrator

Louisville Metro

Louisville Water Company

LOJIC Organization



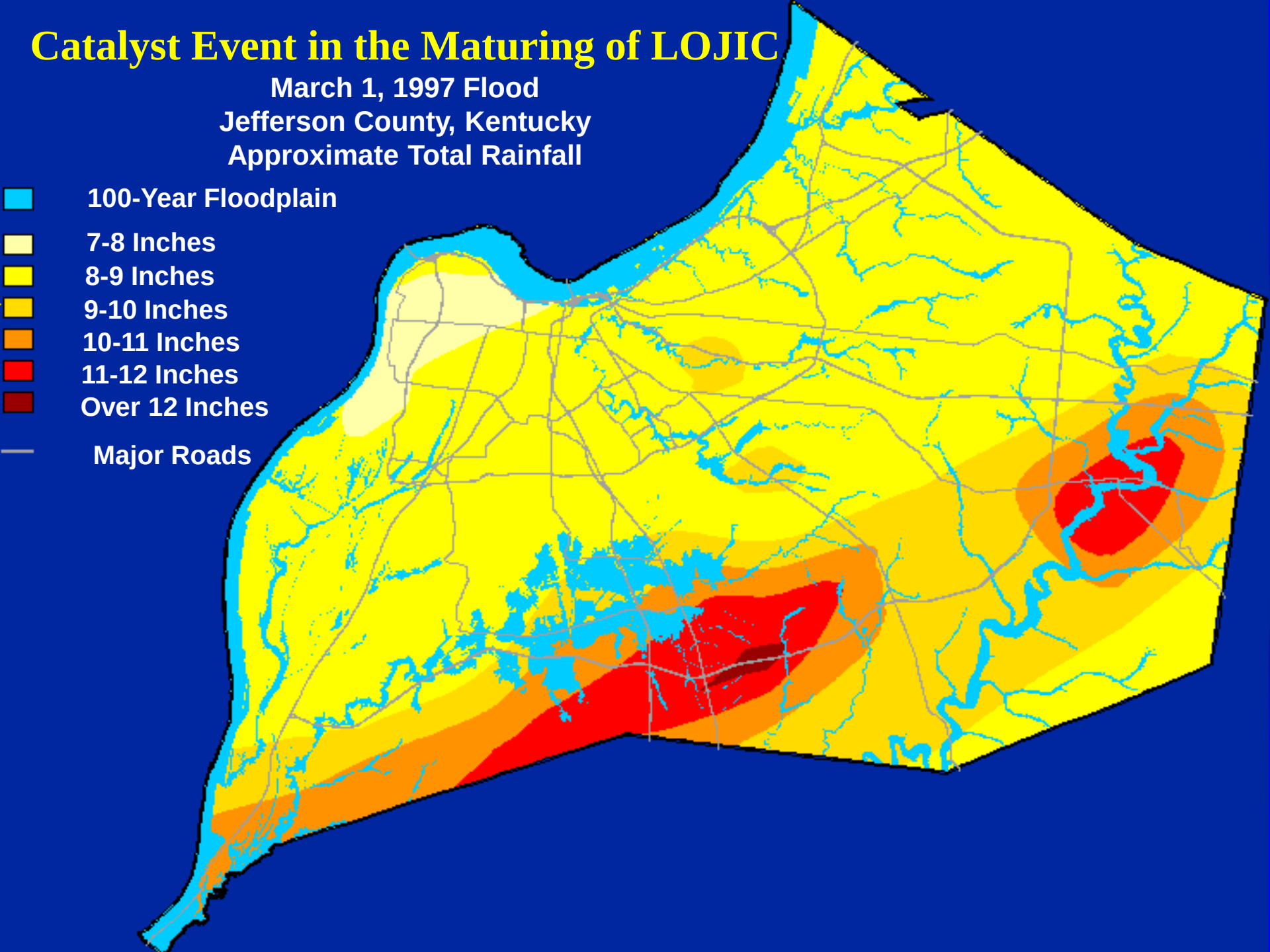
LOJIC "Subscribers"

- LG&E
- TARC
- KIPDA
- University of Louisville
- City of Jeffersontown
- Middletown Fire District
- Bullitt County
- Corps of Engineers
- Oldham County
- Center for Neighborhoods
- Louisville Metro Housing Authority
- Jefferson County Public Schools
- Kentucky Transportation Cabinet

LOJIC GIS Technical Staff

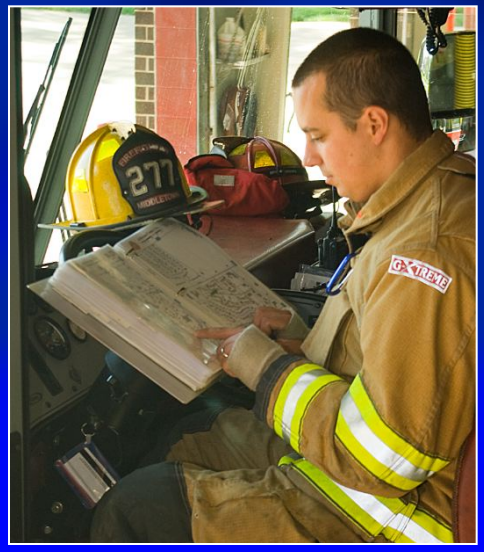
Catalyst Event in the Maturing of LOJIC

March 1, 1997 Flood
Jefferson County, Kentucky
Approximate Total Rainfall



We All Use LOJIC for daily work...

- Shared “warehouse” for critical data
- Addressing
- Emergency response
- Asset management
- Public access
- Spatial analysis
- Rapid response for information
- Modeling
- Maps, maps, maps...



What is a Geographic Information Systems (GIS)?

GIS

is all about a Place in Space.

It's Spatial!

Basic GIS Concepts

There are two basic types of map information:

Spatial information defines the location and shape of geographic features and their relationship to other features.

+

Descriptive information defines the characteristics or attributes of map features.

Basic GIS Concepts

Spatial data are graphically represented as...

Points *(i.e. poles, manholes, sites, events)*

Lines *(i.e. roads, streams, railroads, contours)*

Polygons (Areas) *(i.e. lakes, jurisdictions, soils, floodplains)*

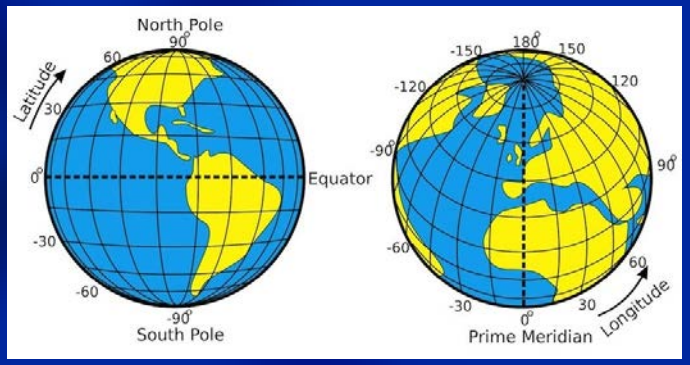
...and may be symbolized based on their associated descriptive data or attributes.

Basic GIS Concepts

The primary coordinate systems used to represent spatial data are:

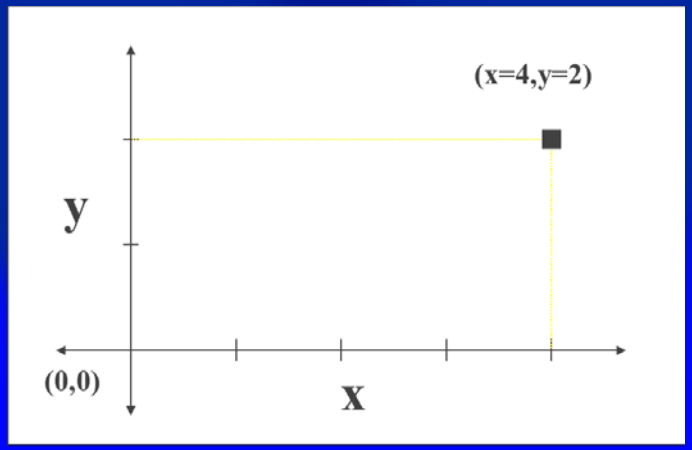
Geographic Coordinates

(latitude, longitude)



State Plane Coordinates

(east, north)

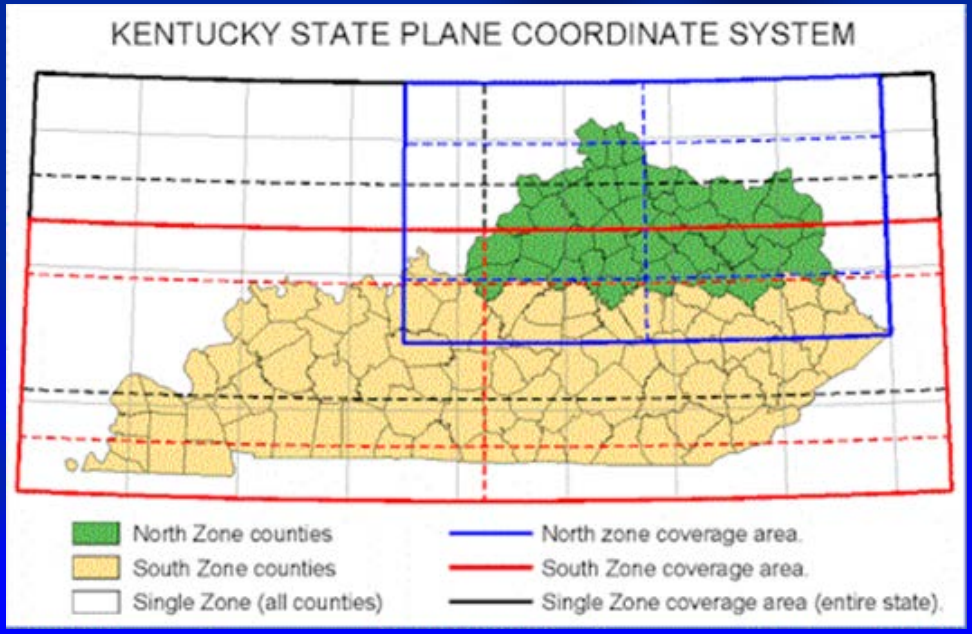


Basic GIS Concepts

All LOJIC GIS spatial databases based on:

Kentucky Coordinate System, North Zone,

North American Datum of 1983 (NAD83)

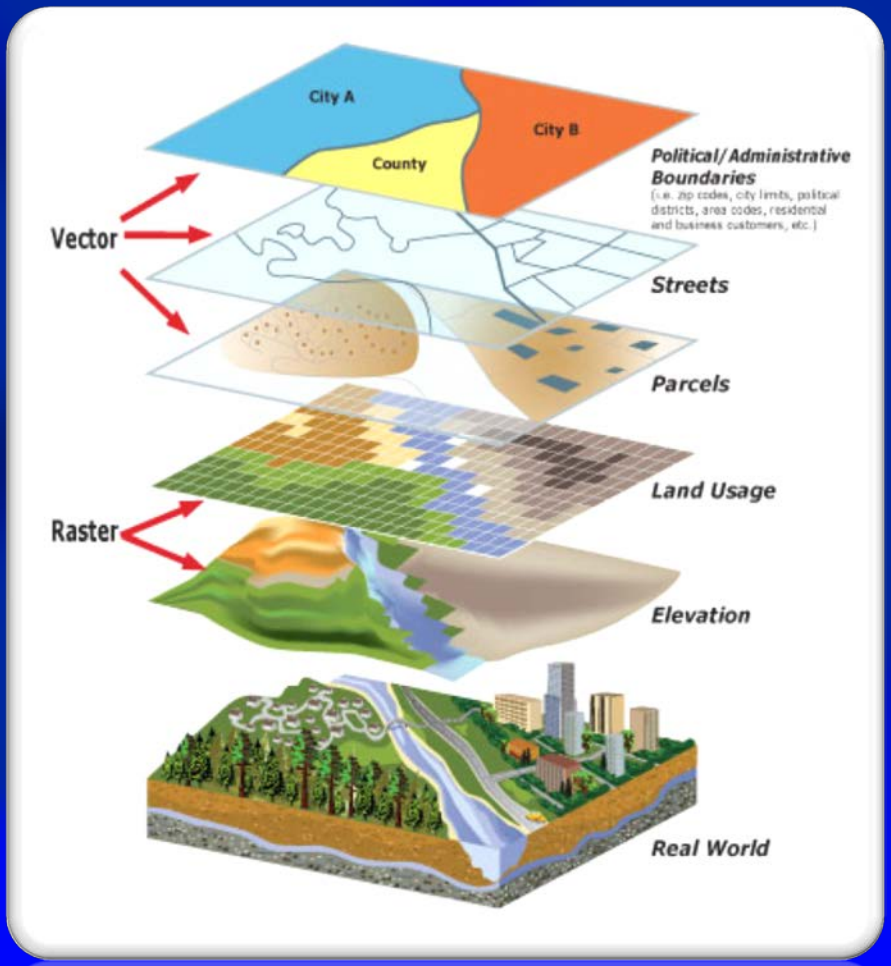


Let’s take a break

Georeferenced Spatial Data

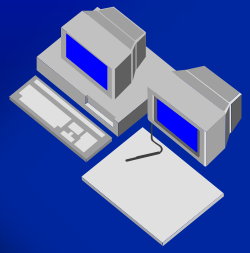
(Vector - Geodatabases, Shapefiles Raster – Grids, Imagery)

…allows spatial overlay for combined topological query and analysis...

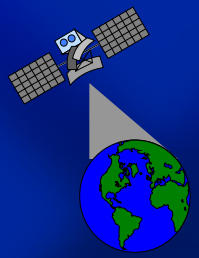


Basic GIS Concepts

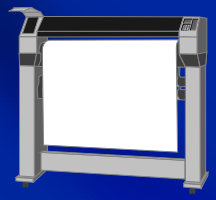
Spatial databases in GIS may be created from:



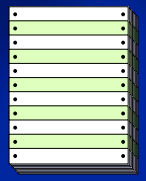
Digitizing



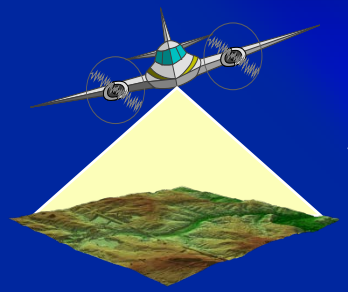
Satellite images



Scanning



Tabular data



Photogrammetry

Basic GIS Concepts

All map features in a GIS have Geospatial Topology which defines the relationships between points, lines and areas...

Lines connect at nodes

Connecting lines define polygons

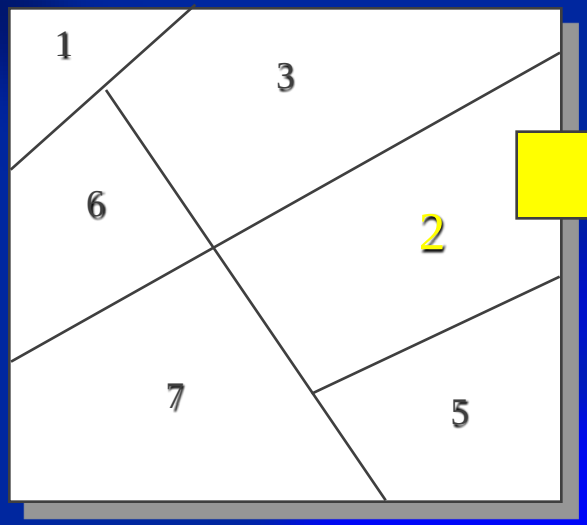
Supported Data Models

ArcGIS supports many geographic data models:

- Shapefiles *(points, lines, polys)*
- Geodatabases *(geometry, attributes, rules)*
- Grids *(raster/surface databases)*
- Images *(scanned digital photography)*
- Computer-Aided Design (CAD) data *(engineering/architectural)*
- Database tables *(Oracle, Sql, etc.)*

Geospatial Data

Geospatial data contains geometry that defines location & shape of geographic features and attributes for feature characteristics...



ID	SHAPE	AREA	CLASS
1	POLY	30564	B
2	POLY	60584	D
3	POLY	76093	A
4	POLY	8976	F
5	POLY	422566	C

Metadata – Information about Data

- file of information which captures the basic characteristics of a data or information resource. It represents the *who*, *what*, *when*, *where*, *why* and *how* of the data.

Our Major Geospatial Databases

- Digital Orthoimagery / LiDAR – 4-inch color, 1-m classified LiDAR, Terrain Dataset, 2-3 year update
- Planimetric / Topographic Mapping - compiled at 1”=100’, 94 features, 3-year update cycle
- Property - 325,000 parcels, ownership, characteristics, assessment, historical data, sales, daily updates
- Site Addresses / Street Address Ranges - daily updates, basis for E911, Hansen and various GIS geoprocessing applications
- Utilities - sanitary sewer, storm drainage, water, gas, power
- Planning - land use, form districts, zoning, preservation districts, political/administrative/emergency districts
- Floodplain - FEMA Flood Insurance Rate Maps

LOJIC Online Hands On

Development Focus:

Go to www.lojic.org and click on **LOJIC Online** under Featured Maps.

Quality of Life Focus:

Go to www.louisvilleky.gov, scroll to the bottom of the page, click on **Maps** and then click on **Residential Services & Locations**.

Hands on Exercise – Using ArcGIS Online

- Go to www.arcgis.com
- Click on ***Sign In***
- ***Create a Public Account***
- ***ArcGIS Exercises***
  - ***Exploring a Map***
  - ***Creating a Map***

MIDAS Upstream Discussion

Go to:

https://appsi.lojic.org/metromapviewer

https://appsi.lojic.org/msdmapviewer

General Use

ArcGIS Desktop Discussion

- General Use
- Brief description of how deployed
- Instructor Demo
- View Metadata

Data Resources

- LOJIC Open Data Site
  - http://data.lojic.org/
- Metro Open Data Site
  - http://data.louisvilleky.gov/
- Kentucky Geography Network
  - http://kygeonet.ky.gov/

Training Resources

- Esri
  - http://www.arcgis.com/home
  - http://learn.arcgis.com
  - http://storymaps.arcgis.com
  - http://www.esri.com/esri-news
- LOJIC
  - http://www.lojic.org/lojic-user-portal/portal

Thank you for your time

If you have any questions, please feel free to contact:

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