

# Geographic Information Systems

A Short Introduction

# Introduction

- ◆ John Koltun
- ◆ Geographic Resource Solutions
  - Founded 1989
  - Provide GIS Consulting and Data Services
  - System Design & Implimentation
  - Data Conversion
  - Geographic Analysis

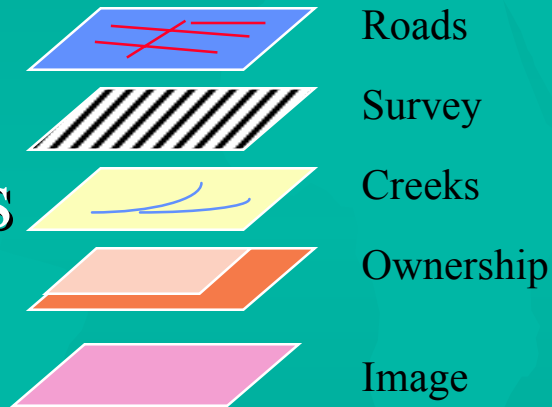


# Geographic Information Systems

- ◆ What is GIS?
  - A system of computer hardware, software, and procedures designed to support the capture, management, manipulation, analysis, and display of spatially referenced data...

# Components

- ◆ Hardware
- ◆ Software
- ◆ Graphics
- ◆ Attributes



Database



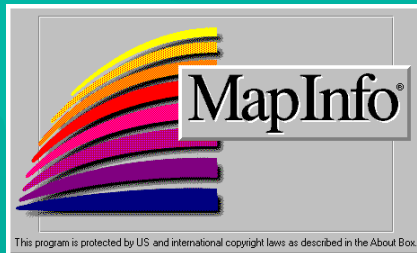
## ◆ Hardware

- PC's
- Workstations
- Network
- Peripherals

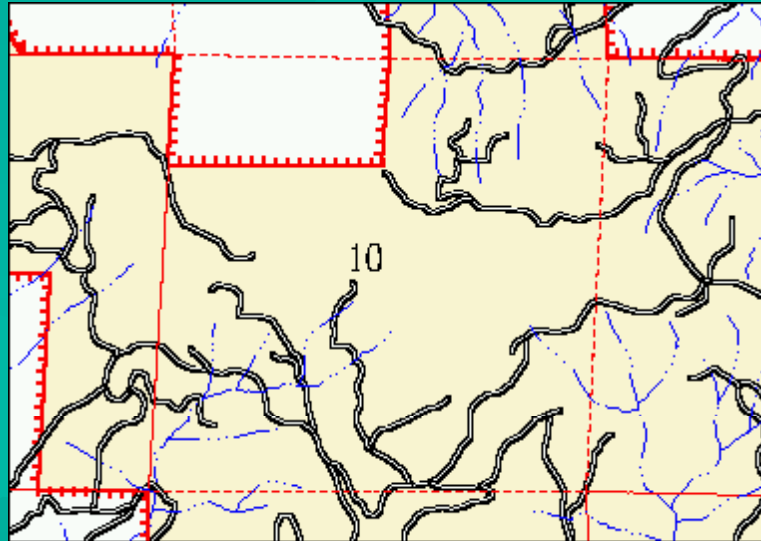


## ◆ Software

- Modular
- Application Add-ons



## ◆ Graphic Database



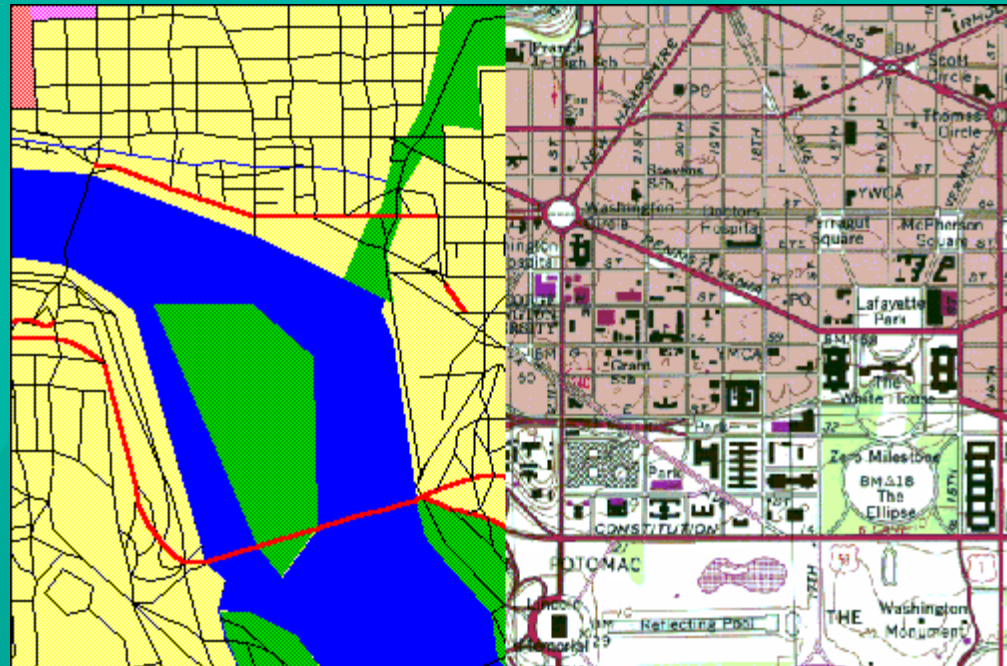
## ◆ Attribute Database

<b>mifcode</b>	<b>mmlink</b>	<b>mapid</b>	<b>inv_ov_type</b>	<b>inv_un_type</b>
241	74	101056	Y22	RDT
241	73	101056	R43	RD
241	72	101056	Y21	DR
241	71	101056	Y21	DR
241	70	101056	Y21	RD
241	68	101056	Y23	RDT
241	65	101056	Y13	RDT
241	64	101056	11	T
241	62	101056	R43	RDT
241	61	101056	Y31	DR
241	63	101056	Y23	DT

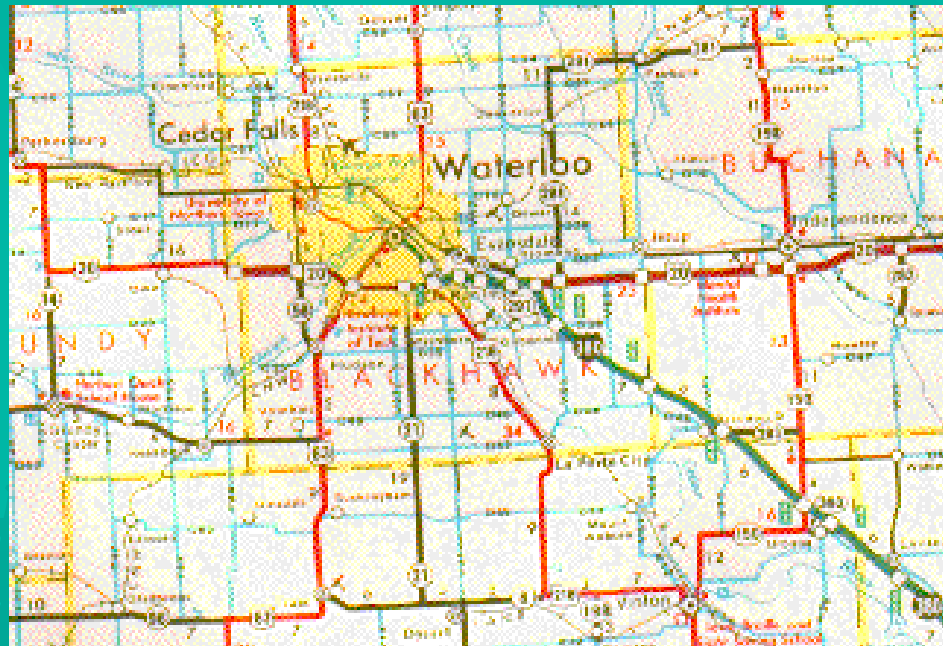


# Data Types

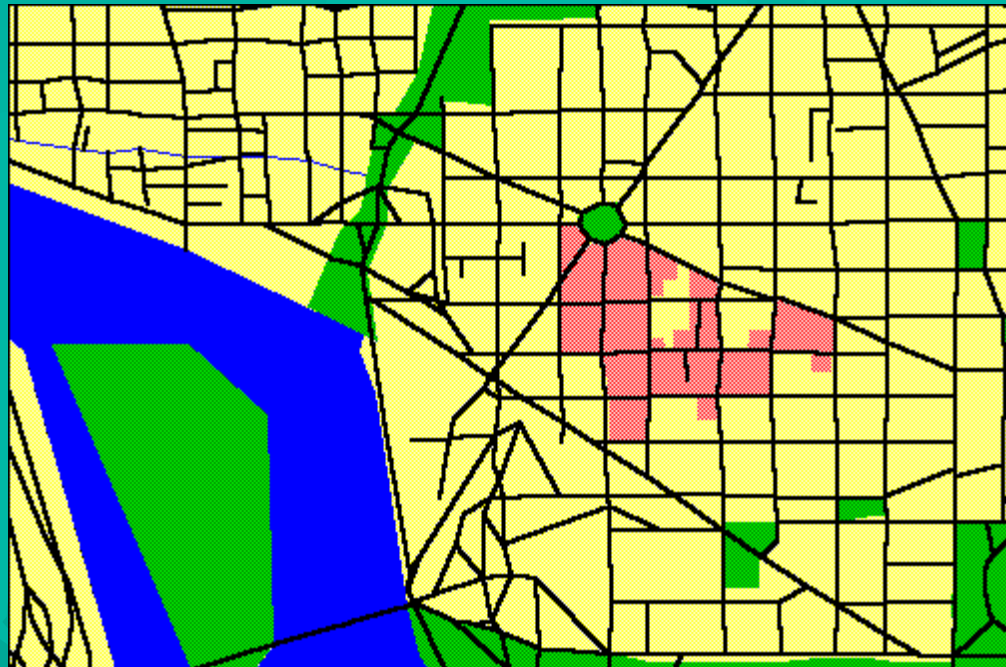
- ◆ Raster Data
- ◆ Vector Data



- ◆ Raster Data
  - Scanned Images



- ◆ Vector Data
  - CAD Data



# GIS Functionality



- ◆ Query
- ◆ Overlay Analysis
- ◆ Modeling



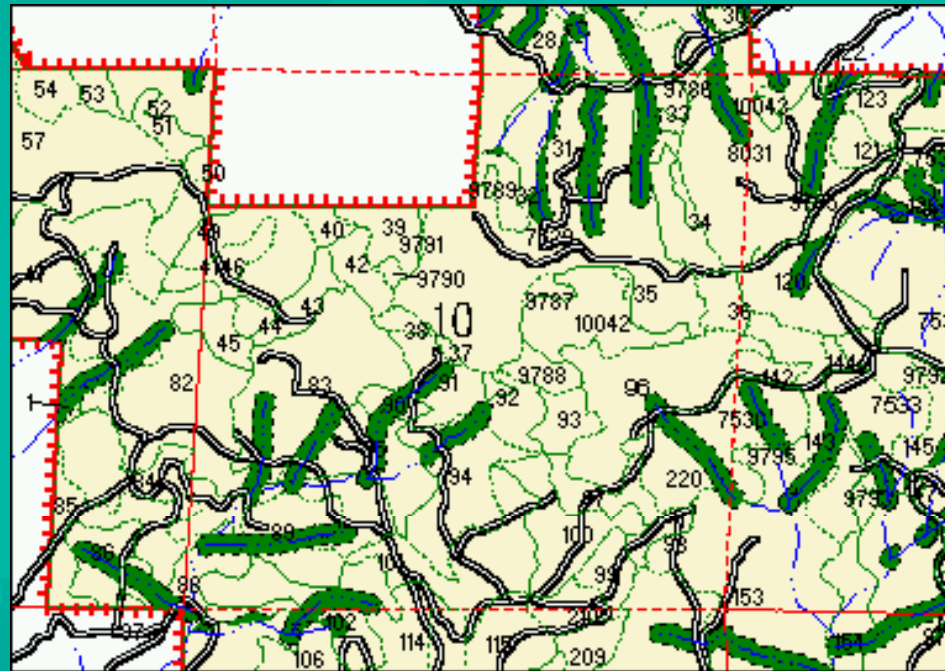
## ◆ Query

- Ask questions of the database

- ◆ Show me a list of all businesses with hazardous materials in stock.

- 
- Ask questions of the graphics
    - ✦ Show me the location of these businesses.

## ◆ Overlay Analysis





– Buffering:

- ◆ Show me a list of the residences within 500 feet of these businesses.





– Intersections

- ◆ Show me all of these businesses in the 100 year flood plain.



## ◆ Modeling

- Simulate future situations based on algorithms using database and map information
- Growth projections
- Traffic Modeling
- Sewer/Water demand.

# Applications

- ◆ Facilities Management
- ◆ Emergency Services
- ◆ City Planning
- ◆ Parcel Management
- ◆ Utilities
- ◆ Transportation
- ◆ Resource Management

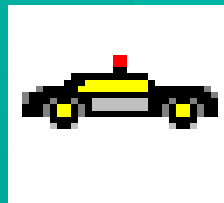
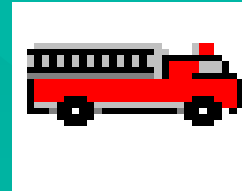
A faint, light-colored world map is visible in the background of the slide, centered behind the text.

## ◆ Facilities Management

- Site Mapping
- Parks Management
- Environmental Assessment

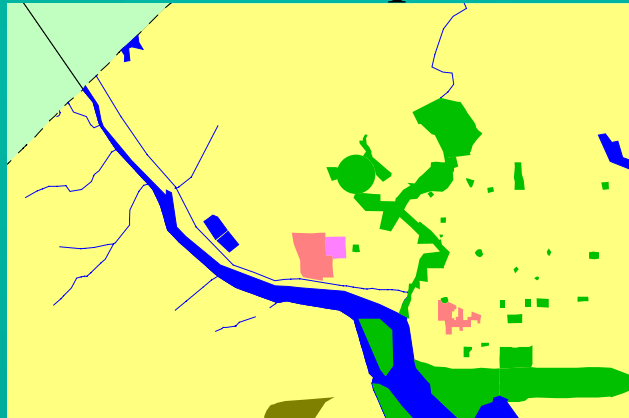
## ◆ Emergency Services

- Crime Mapping
- Crime Analysis
- Disaster Management
- E911



## ◆ City Planning

- Zoning Changes
- Long Term Plan Development



A faint, light-colored world map is visible in the background of the slide, centered behind the text.

## ◆ Parcel Management

- Tax Billing
- Notifications
  - ◆ All parcels adjacent to a subdivision.
- Subdivisions
  - ◆ Permit tracking & management.



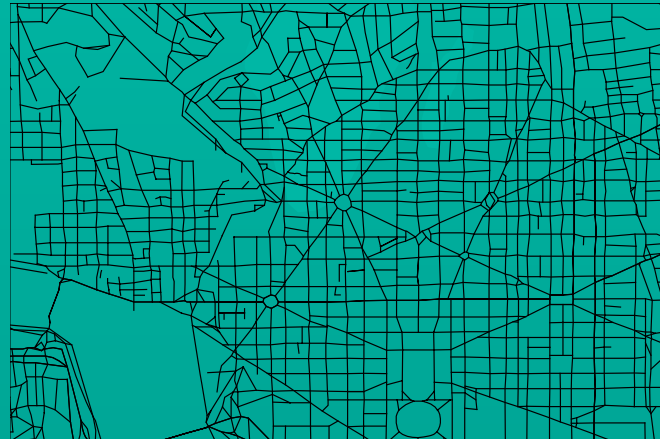
## ◆ Utilities

- Water/Sewer Systems Inventory
- System Demand Modeling
- Emergency Notification
  - ◆ All houses serviced by a water main.



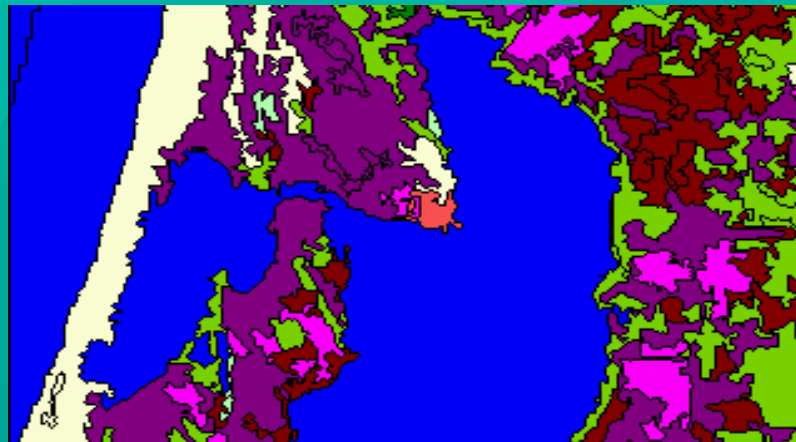
## ◆ Transportation

- Pavement Surveys
- Maintenance Scheduling
- Traffic Modeling



## ◆ Resource Management

- Land Cover Mapping
- Green Belt Management
- Wetlands Inventory and Management



# REQUIRED Steps for Selecting Your GIS

- ◆ Needs Analysis
- ◆ Functional Design
- ◆ System Selection
- ◆ Database Design
- ◆ Data Conversion
- ◆ Implementation
- ◆ Training

