

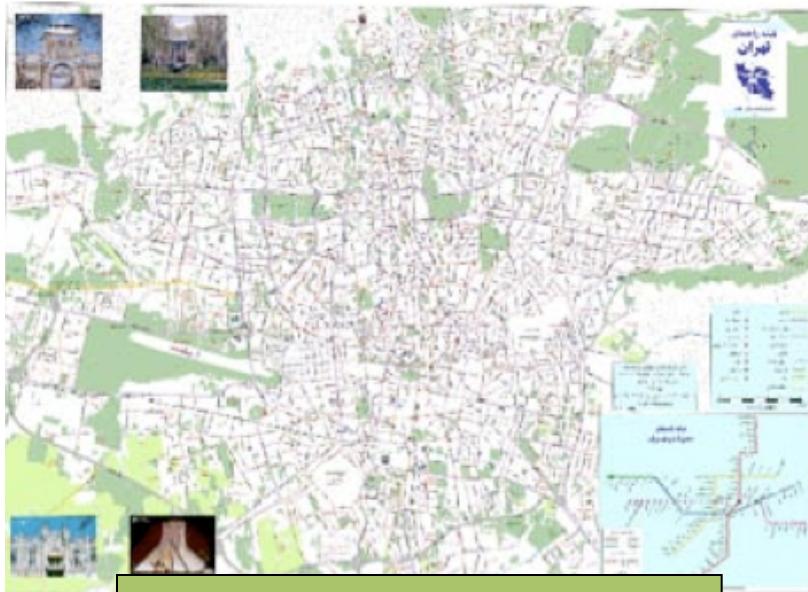
# Harvesting Named Geographic Features from Raster Maps

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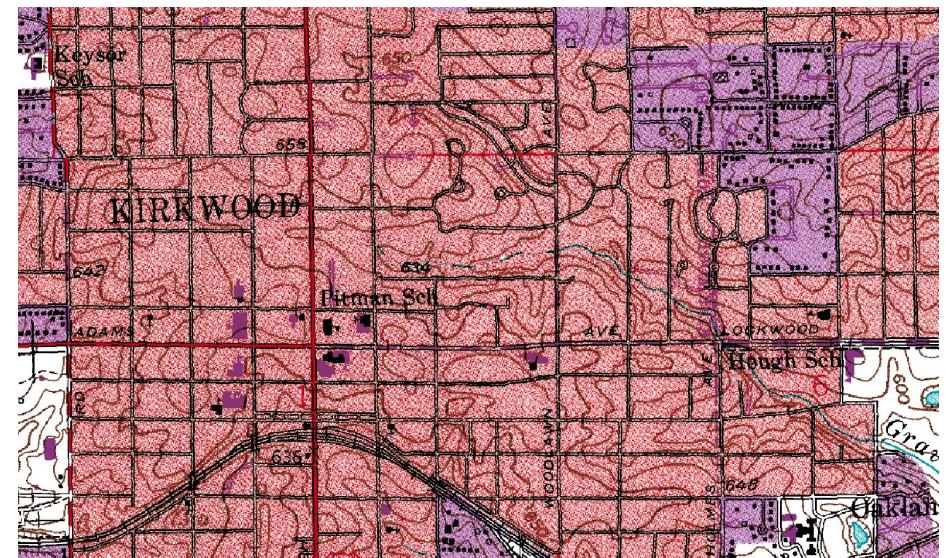
University of Southern California  
&  
Geosemble Technologies

# Introduction

- Raster maps are a rich source of geospatial data:
  - Easily accessible
  - Many different types of information
  - Often contains information that cannot be found elsewhere



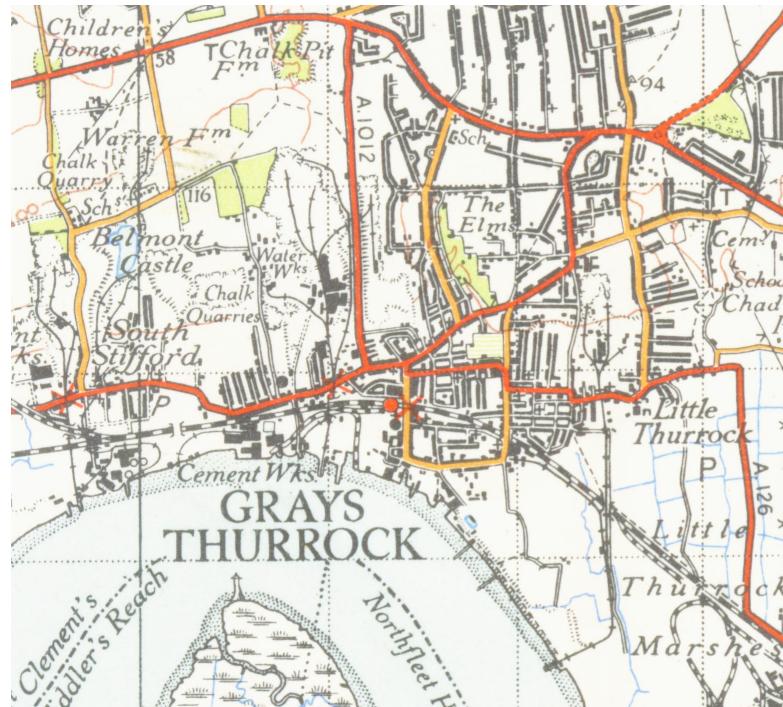
Travel map of Tehran, Iran



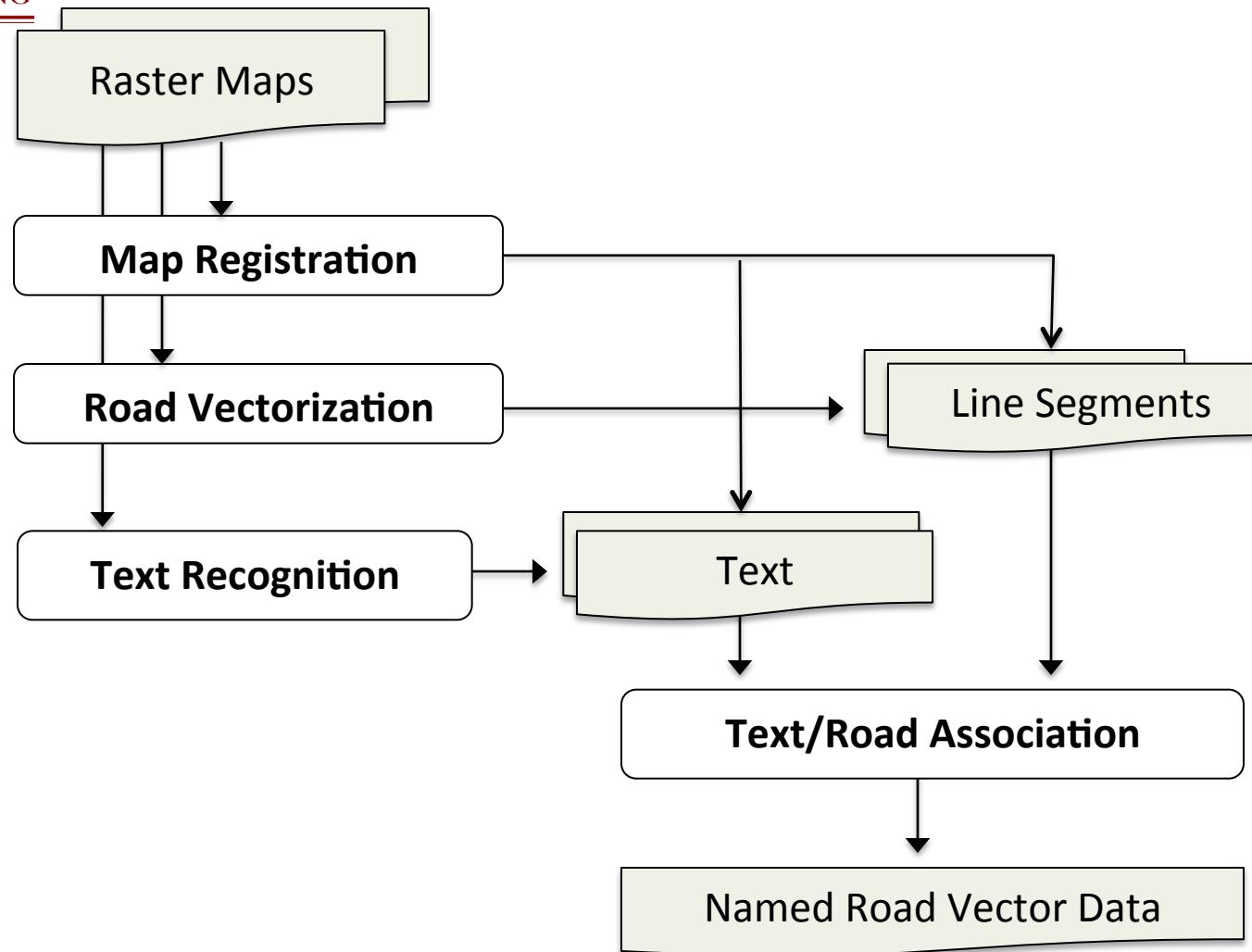
USGS topographic map of St. Louis, MO

# Challenges

- Maps have lots of useful information, but...
  - They have overlapping features
  - There is limited access to the meta-data
  - Often only available in raster format
- How do we register, extract, and recognize the features in a raster map

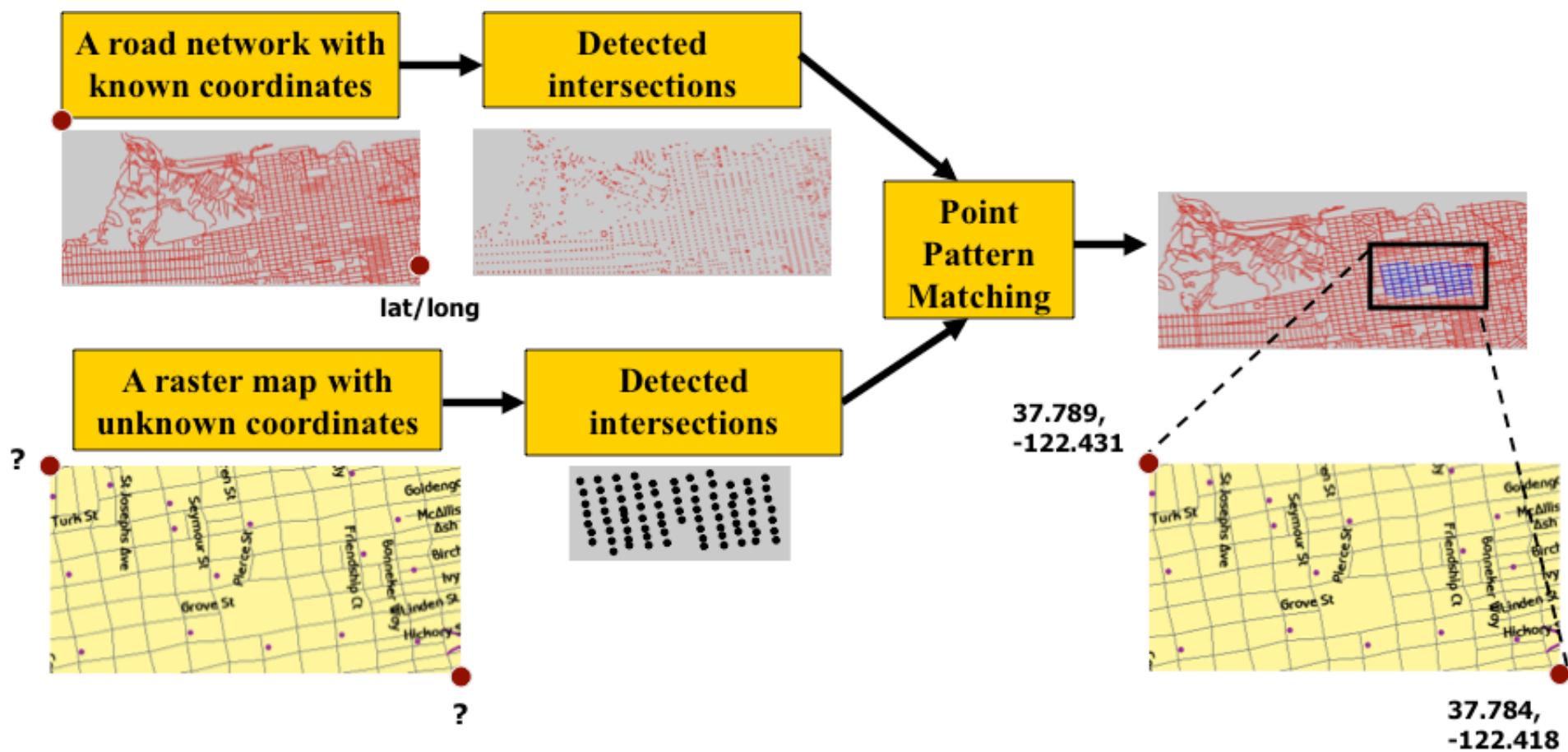


# Extracting Named Road Vector Data

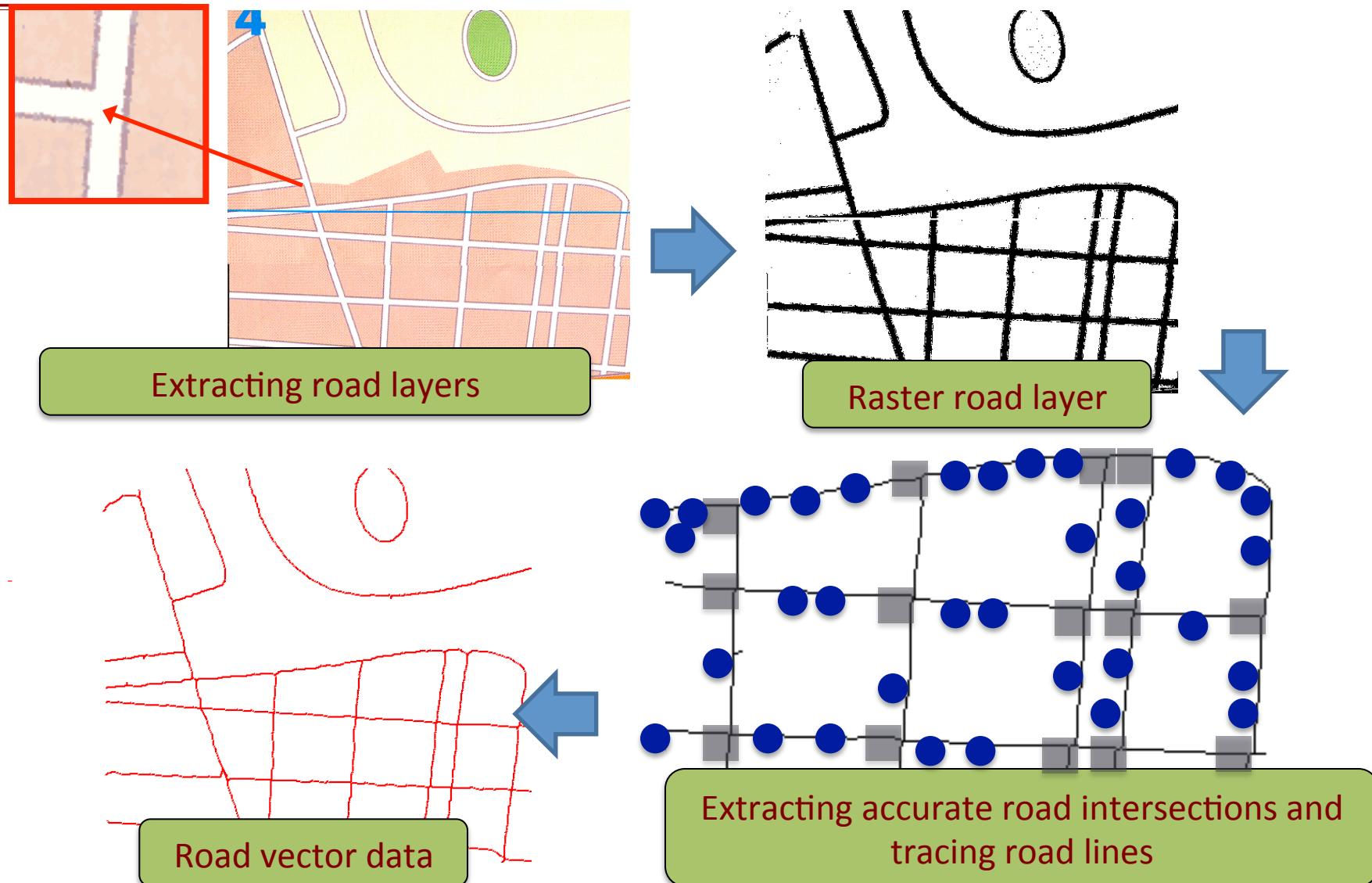


# Automatic Map Registration

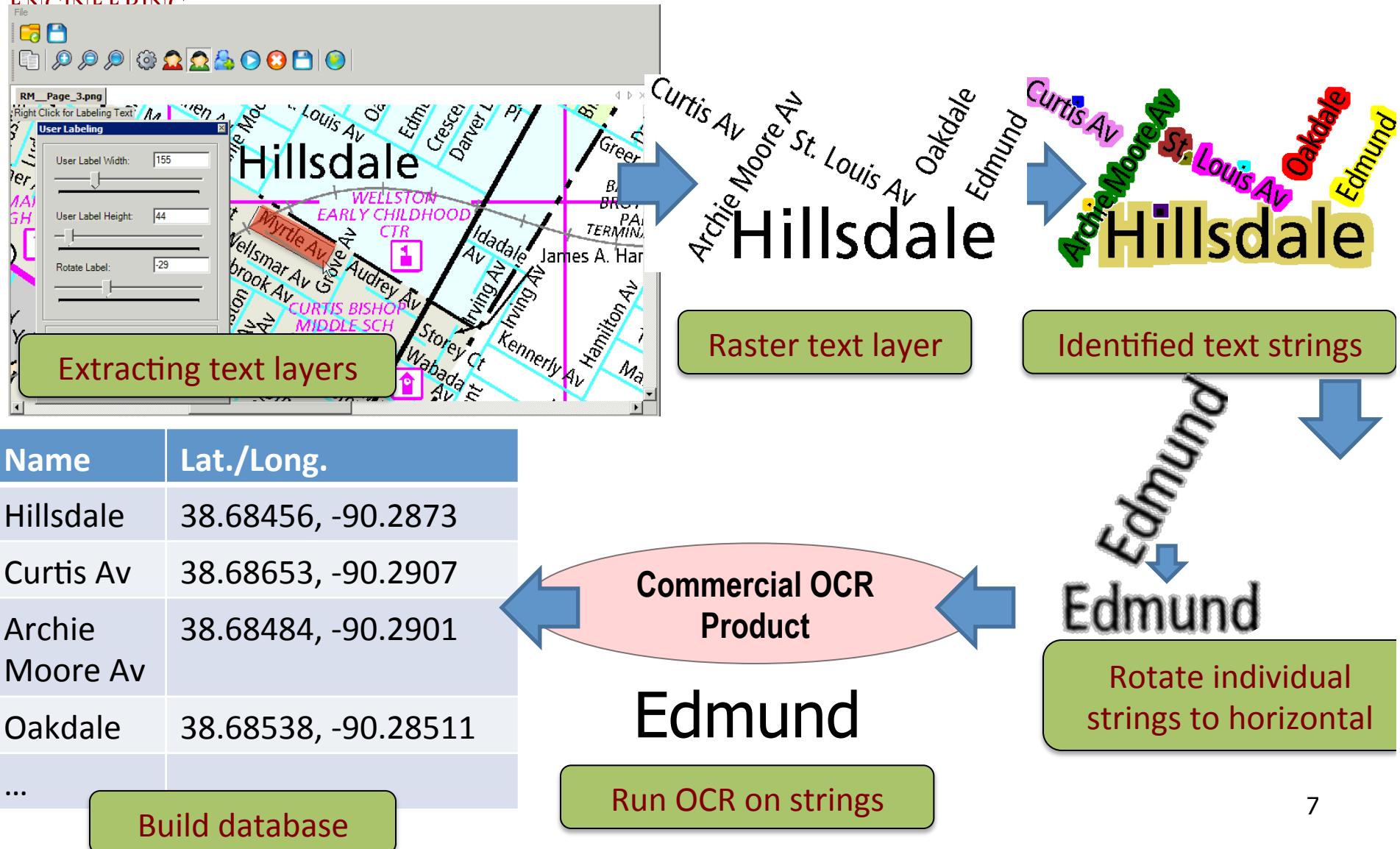
- Exploit the pattern of intersections found on a map and compare to a road vector dataset



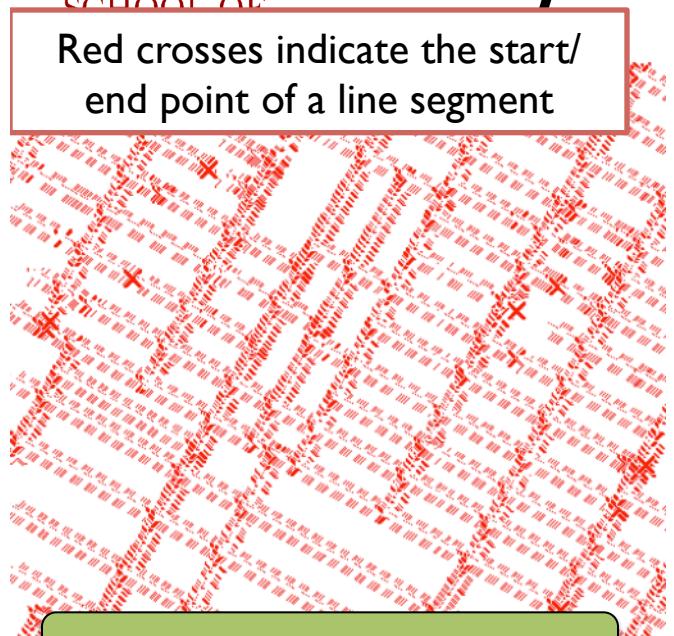
# Road Vectorization



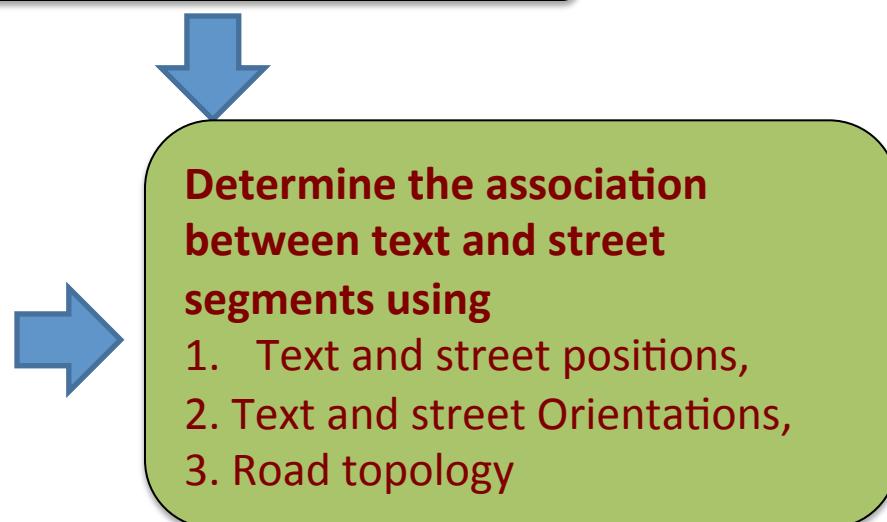
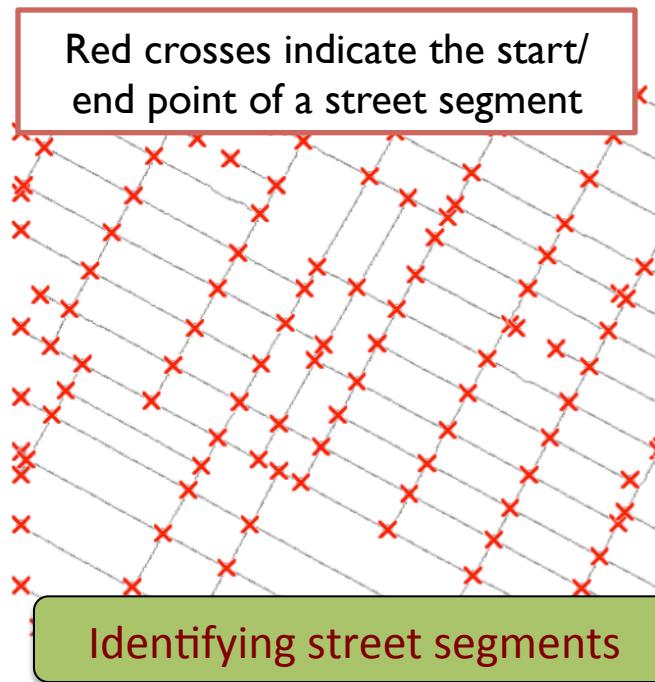
# Text Recognition



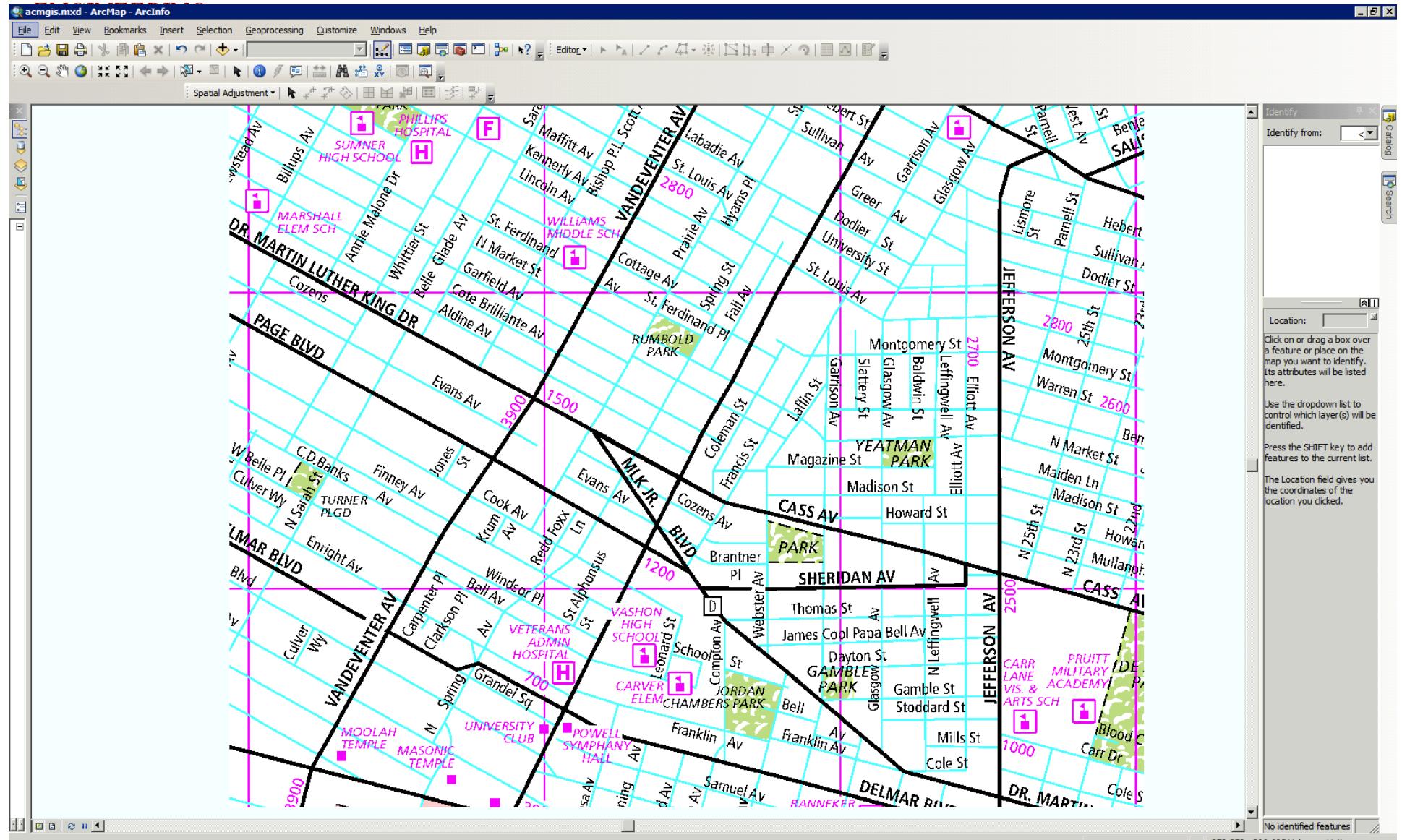
# Text/Road Association



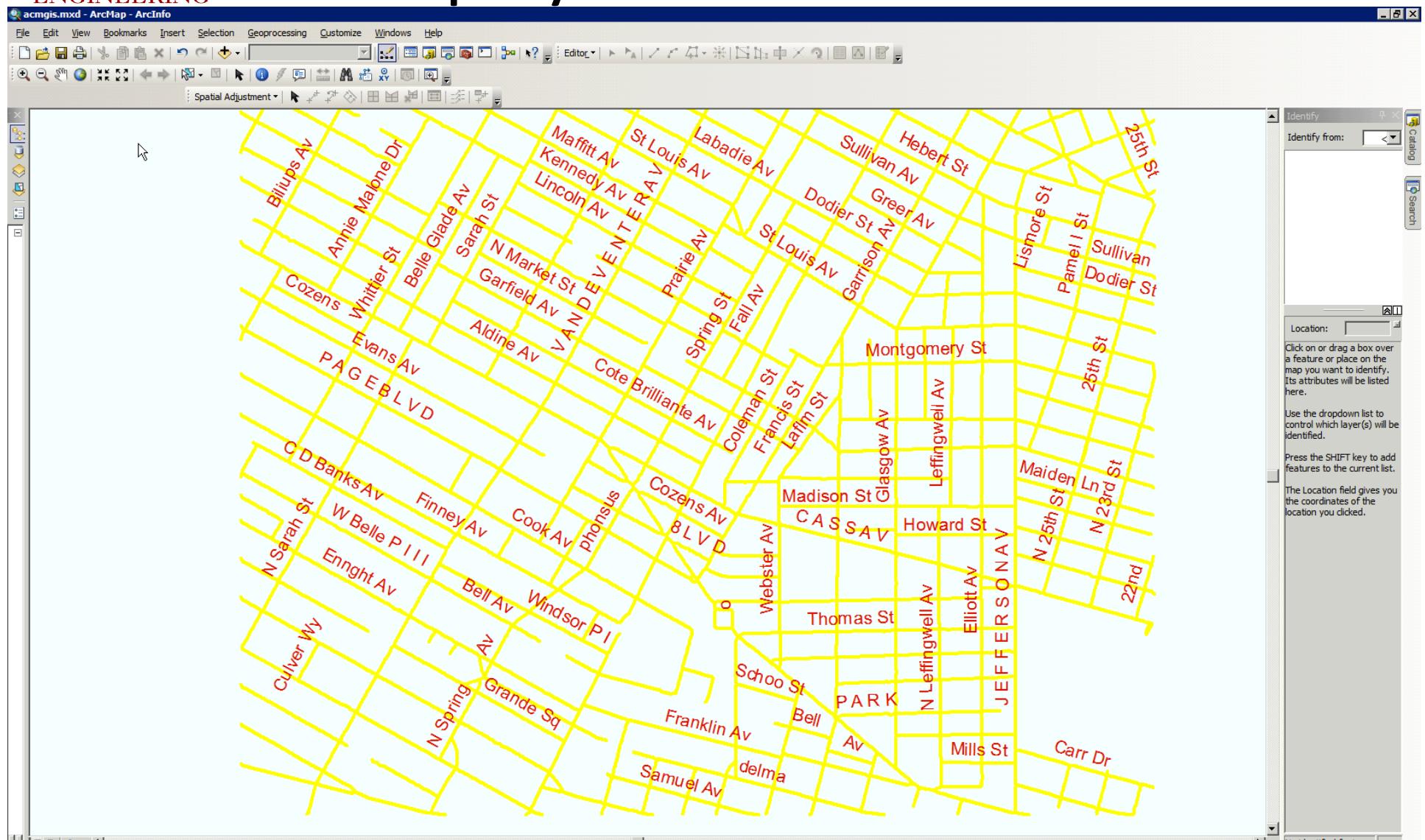
Name	Lat./Long.
PAGE BLVD	38.52356, -90.1283
Billups AV	38.52483, -90.1290
Cozens	38.52424, -90.1291
Evans Av	38.52267, -90.1281
...	Recognized text



# Example Map



# Resulting Vector Layer Displayed in ArcGIS



# Discussion

- Developed a general approach to registering, extracting, and recognizing features in maps
  - Applies to a wide variety of maps
  - Supports automatic registration of maps
  - Build geospatial layers from poor quality scanned maps
- Applications
  - Annotating imagery
    - Extracted text labels can be used to label imagery
  - Creating and updating maps
    - Provides the ability to create and update maps for regions where we don't have good map data
  - Constructing gazetteers
    - Construct geographic name databases
    - Critical for linking text (e.g., news, blogs, tweets, etc) to geographic locations
      - See demonstration of Gesemble's GeoXray at booth 103

# More Information

- See our papers:
  - <http://www.isi.edu/~knoblock>
- Send me email:
  - [knoblock@isi.edu](mailto:knoblock@isi.edu)
- Come to the Geosemble booth
  - Booth 103