Outline

• Definitions
• Data
• Address Locators
• Geocoding
• Demonstration
An address is simply a method used to describe and reference a location.

- A location is based on an existing feature in a GIS database.
- A location can be a street address (9609 College Ave).
- Place-name (Indianapolis).
- A specific location that has been identified and/or defined (9609 College Ave, Indianapolis, IN 46280).
What is Geocoding?

Geocoding is the process of transforming a description —such as a pair of coordinates, an address, or a name of a place—to a location on the earth's surface. (ESRI)

Address Locator

An ESRI tool used to execute the geocoding process within the ArcGIS environment.
- Can be built by any user
- Built using location data
- Standardized address search
Understanding Data Sources
Used for creating locators (geocoding)
**Point Data**

Represents the address location
- May be a point near to an exact location (Option A)
  - Roof-top accuracy
  - Driveway/entrance
  - Parcel Centroid
- May be approximate (Option B)
  - Interpolated from a street segment
  - Zip Code or Place centroid (Option C)
Where does point data come from?

- Collaboration between county governments and the state
- Data originates at the county
- The state regularly harvests county data for integration into a single dataset.

- Currently over 3 million address points in the GIO dataset
- GIO is not complete
- TIGER Data is used where county data missing
“Cleaning up” Data
(AKA: Locator)

- Locator updated last fall
- [https://gis.in.gov/arcgis/services](https://gis.in.gov/arcgis/services) (State)
- Currently being updated again
- Location data has multiple errors

Errors:
- No data
- Incomplete Data
- Unusable Data
- Varied standardization
Improving Point Data

The Standardization Process

- Addresses are reformatted
  - Use an in-house algorithm (ISDH) developed for our GeoRunner web service
- Not all addresses standardize well
  - Addresses with ½
  - Streets with odd names
- Reformatted data is checked for accuracy

Standardized data = better address locator

19544 Lake Site Drive

<table>
<thead>
<tr>
<th>19544 E LAKE STE DR</th>
<th>19544</th>
<th>E</th>
<th>LAKE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4323 W 700 S</td>
<td>4323</td>
<td>W</td>
<td>700</td>
</tr>
</tbody>
</table>
### Enhancing Point Data

**Finding missing Data**
- Spatial join with the county parcels (property address)
- Spatial join with census ZCTA (Zip Code Tabulated Area) data (2010)
- When ZCTA data is used the USPS preferred city is assigned
- Time management: Unusable data is deleted
- Usable data goes through the reformatting process

**Additional Information**

**Alternate city names (Speedway)**

**Alternate zip code names (Town of Yorktown)**
Understanding Street Data (Option B)
Street segments
- Split at each intersection.
- Contain and address range
- Locator interpolates the point
- Comes from current TIGER data
- Can have direction (to or from)

Some required fields
- From Left
- To Left
- From Right
- To Right
- Street Name

What is Street Data?

<table>
<thead>
<tr>
<th>Left FROM HH</th>
<th>Left TO HH</th>
<th>Right FROM HH</th>
<th>Right TO HH</th>
<th>STREET NAME</th>
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<tbody>
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<td>10000</td>
<td>10024</td>
<td>10001</td>
<td>10025</td>
<td>Winchester Rd</td>
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<tr>
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<td>10001</td>
<td>10065</td>
<td>Church Rd</td>
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<td>W 900 N</td>
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<td>345</td>
<td>309</td>
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<td>3330</td>
<td>W 750 S</td>
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<td>579</td>
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<td>6999</td>
<td>6800</td>
<td>E 1150 N-1</td>
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<td>5973</td>
<td>5973</td>
<td>E 1050 N-1</td>
</tr>
</tbody>
</table>
Creating an Address Locator

- Have a primary reference table with x,y data.
- Created in ArcCatalog from a variety of styles.
- Style depends on the attributes in the primary reference table.
- Reference fields are set using the field map.
- Made from a variety of data types
- Accuracy depends on the primary table

Address locators also contain projection information!
Address Locators
Composite Locator

- Contains multiple locators
- Allows for more address matching types.
- Order is important...the locators are searched from the top down.
- Once an address is matched searching stops for that address.

No match found address passed to next locator

Match found

GIO

Alternate City

Street Segment

Centroid

No match found address passed to next locator

Match found

Match found

Match found

No match found

Find tool can show all possible candidates

NOTE
Why all the work?

• Current cost for batch geocoding (ArcGIS online) is $40/10,000
• In House = unlimited batch geocoding
• The ISDH geocodes ~ 5 million addresses in one year!
• Savings of $20,000 based on current rates
• ISDH is one agency
• Multiple agencies & users = you do the math

• Can make custom locator (ISDH Facilities)
• [https://gis.in.gov/arcgis/services](https://gis.in.gov/arcgis/services) (State)
Now for geocoding...
Parts needed for geocoding

Dataset
With addresses

Address Locator

Point Feature Class

Locator
Address Matching Process

1. Add the address table to the map
2. Choose the Address Locator
3. Set the geocoding parameters
4. Match the Addresses
5. Adjust geocoding parameters

Geocoding can be done from ArcCatalog or ArcMap.
Customize → Toolbars → Geocoding

- Shows available address locators
- Use ArcGIS Online or local locators
- [https://gis.in.gov/arcgis/services](https://gis.in.gov/arcgis/services) (State)
- Can use the Map Extent to limit search
- Quick way to search and view single address
Can be any database table. Common formats are: .xls, .xlsx, .dbf, .txt, .csv, .mdb tables, Oracle tables.
Right-click → Geocode Addresses

Choose Address Locator
- State (https://gis.in.gov/arcgis/services)
- Local
- Custom
- ArcGIS On Line

Start Geocoding

Check Parameters
• Select the address table
• Choose Address Input Fields
• Defaults parameters will be set...they can be changed
• Advanced Geometry: Sets projection
• Geocoding Options:
  ➢ Offsets set at 0
  ➢ Check (✓) X and Y coordinates
  ➢ Check (✓) Reference data ID if needed
  ➢ Composite: Parameters set for each locator
  ➢ Match ties only needed for street segments

Geocoded feature class will have points only for matches and ties

Some records will not have corresponding points because of errors in the data
Unmatched addresses can be matched manually

Some records may not be matched due to data entry errors!!!
Address Geocoding
Contact GIO Office

Questions???