



GIS TRAINING GROUP

- 📍 Creating a statewide GIS repository for NG9-1-1
- 📍 Providing 9-1-1 GIS stakeholder training at no cost
- 📍 Supplying grants to improve and maintain your 9-1-1 GIS data

STATEWIDE NG9-1-1 TRAINING INTRODUCTION TO ArcGIS

DATA**M**ARK

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TRAINING OVERVIEW

Module 1 & 2: Introduction to GIS Concepts PowerPoint	01
Module 3: Introduction to ArcGIS	02
• Introduction to ArcCatalog	
• Introduction to ArcGIS Desktop	
• Adding Data to the Map	
• Symbology and Labeling	
• Exploring Attributes	
• Spatial Query	
• Editing Geometry and Attributes	
• Class Exercises	
• Best Practices for NG9-1-1 GIS Data Management	
Module 4: Tying it all Together	14
• Advanced Editing Techniques	
• Topology	
• Open Discussion / Data Q&A	
Module 5: Preparing GIS Data for NG9-1-1	15
• OK NG9-1-1 GIS Data Standard	
• OK NG9-1-1 GIS Toolkit	



MODULE 3: INTRODUCTION TO ArcGIS

Introduction to ArcCatalog

[Data Management using ArcCatalog](#)

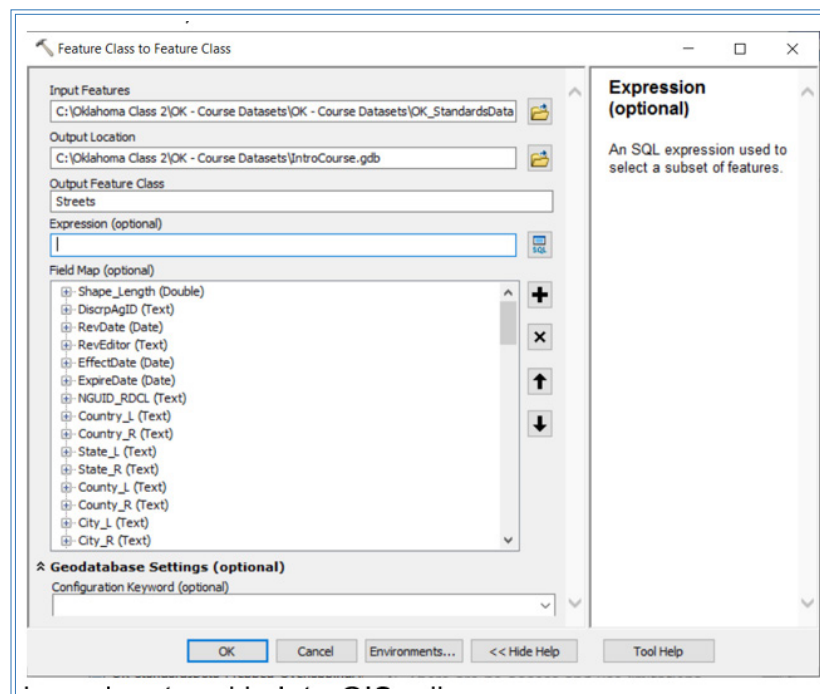
- Open ArcCatalog. The Catalog Tree is on the left and contains the folder structures in which the GIS data is stored.
- Navigate to the Folder with the Course Data, and click the **OK_StandardsData_Initial** geodatabase
- Expand the + next to the geodatabase to expand the contents
- Click Centerlines in the Catalog Tree and explore the data
 - Click the Contents Tab
 - Click the Preview Tab
 - » Click the drop down in the Preview Tab, and select Table to explore attributes
 - Click the Description Tab to explore metadata

[Creating a New Geodatabase](#)

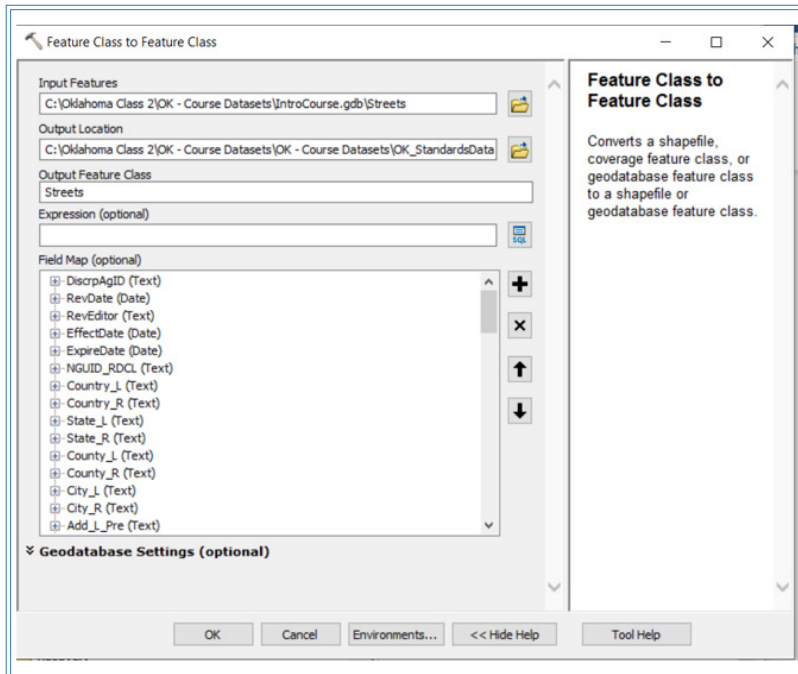
- Right click on the OK – Course Datasets folder and click New > File Geodatabase. The new geodatabase appears in the folder but there are no contents.
- Right click the new geodatabase and click Rename. Rename the newly created geodatabase to IntroGIS. The file extension .gdb is automatically applied.

[Importing/Exporting Data to and from the Geodatabase](#)

- Right click on IntroGIS.gdb and click Import > Feature Class (single)
- For Input Features, select the folder and navigate to **OK_StandardsData_Initial.gdb**
- Double-click NG911 and select ROAD_CENTERLINE and click Add
- The Output Location is set to IntroGIS.gdb
- For Output Feature Class, name the file Streets and Click OK



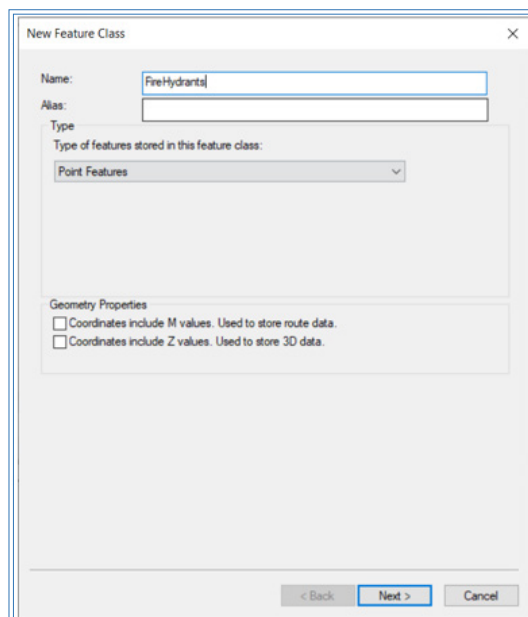
- Streets should now be stored in IntroGIS.gdb
- Right-click Streets within the IntroGIS.gdb and click Export > to Geodatabase (single)
- For Output Location, navigate to **OK_StandardsData_Initial.gdb** and click Add
- For Output Feature Class, name the file Streets (keep the same name) and click OK



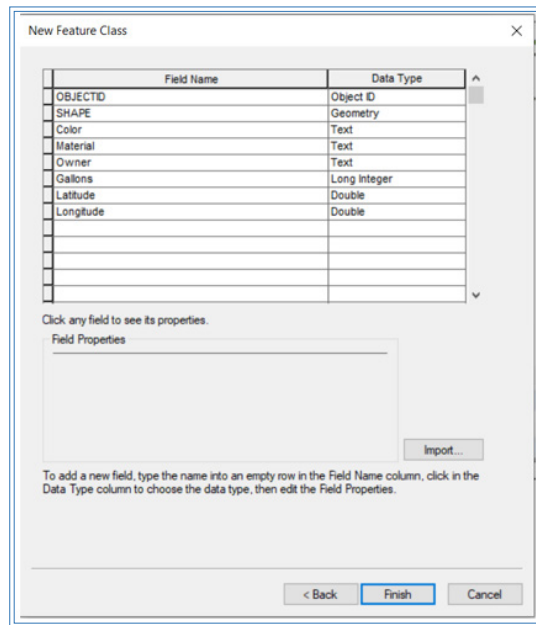
- Navigate to **OK_StandardsData_Initial.gdb** to verify Streets has been added to the geodatabase

Creating a New Feature Class

- Right-click on **OK_StandardsData_Initial.gdb**
- Scroll down to New > Feature Class
- Name the feature class FireHydrants and choose Point Features as the Type



- Click Next
- The default coordinate system is WGS 1984. Click Next, and then click Next to accept the default XY Tolerance.
- Click Next for Database Storage Configuration
- Add the below fields (field name, field type, field length)
 - Color, Text, 50
 - Material, Text, 50
 - Owner, Text, 50
 - Gallons, Long Integer
 - Latitude, Double
 - Longitude, Double



- Click Finish

NOTES:

Introduction to ArcGIS Desktop

[Customizing Interface](#)

- Follow the Instructors' examples of how to customize your ArcGIS Desktop interface

[Toolbars](#)

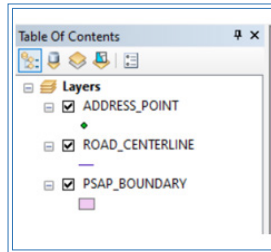
- Right-click in the gray space in ArcGIS Desktop to expand the list of available toolbars
- Select the Toolbars to add them to the interface
 - Editing
 - Advanced Editing
 - Snapping
 - Standard
 - Topology

NOTES:

Adding Data to the Map

[Explore Course Data](#)

- Click the Add Data Button. Navigate to OK_StandardsData_Initial.gdb.
- Double-click NG911 and add the feature classes PSAP_BOUNDARY, ROAD_CENTERLINE, and ADDRESS_POINT and click Add



- The feature classes appear in the Table of Contents
- Explore List by Drawing Order, List By Source, List By Visibility, and List By Selection buttons in the Table of Contents
- Right-click on one of the feature classes to see the functionality available for that feature class.

[ESRI Basemap Imagery](#)

- In the Dropdown next to Add Data, select Add Basemap
- Choose a Basemap to add and explore

[The Tools Toolbar](#)

- Navigate: Follow Instructors' examples of navigating ArcGIS Desktop using the following tools: Zoom In/Zoom Out, Pan, Full Extent, Fixed Zoom In/Fixed Zoom Out, Previous Extent/Next Extent
- Interact: Follow Instructors' exercises of interacting with feature classes in ArcGIS Desktop using the following tools: Select Features, Identify, Measure, and Find

[Class Exercises](#)

1. Use Select to draw a box around a subset of data. Change Select to 'Lasso' and select a subset of points to exclude a nearby road.
2. Zoom to an Address Point and use Identify to determine the feature's City value.
3. Zoom to an Address Point and use Measure to determine how many yards the point is from the associated Road Centerline.
4. Use Find to search for the street named 'RUBY' within the Road Centerlines. Next, search for Address Points with the same street name.

NOTES:

Exploring Attributes

- Right-click on the ADDRESS_POINT feature class and select Open Attribute Table

OBJECTID	Shape	DiscripAgID	RevDate	RevEditor	EffectDate	ExpireDate	NGUID_ADD	Country
1951	Point ZM	<Null>	10/8/2020 7:21:31 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
2267	Point ZM	<Null>	10/8/2020 7:21:51 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
2274	Point ZM	<Null>	10/8/2020 7:21:51 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
2281	Point ZM	<Null>	10/8/2020 7:21:51 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
2682	Point ZM	<Null>	10/8/2020 7:22:34 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
145	Point ZM	<Null>	10/8/2020 7:17:39 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
146	Point ZM	<Null>	10/8/2020 7:17:39 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
200	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
236	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
237	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
239	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
240	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
241	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
242	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA
243	Point ZM	<Null>	10/8/2020 7:18:19 PM	JDOE	<Null>	<Null>	<Null>	UNITED STATES OF AMERICA

- Click Table Options to explore functionality within the attribute table
- Mouse over the City field and click to select. Right click and choose Sort Ascending. This will sort the field values in Ascending order.
- Use Select by Attributes to select a specific set of attributes within a field. In this example, we will select the address points which have Inola as the City.
 - Click Select by Attributes in the attribute table.
 - We are creating a new selection and do not need to adjust the Method
 - Scroll down through the list of attributes in the window and double-click City. City populates in the query box in the bottom of the window.
 - Click the = button
 - Click Get Unique Values and double-click INOLA. INOLA will populate in the query box at the bottom of the window.

Select by Attributes

Enter a WHERE clause to select records in the table window.

Method: Create a new selection

State
County
City
AddPre
Address

= <> Like 'INOLA'
> >= And 'UNINCORPORATED'
< <= Or
_ % () Not
Is In Null Get Unique Values Go To: []

SELECT * FROM ADDRESS_POINT WHERE:
City = 'INOLA'

Clear Verify Help Load... Save... Apply Close

- Click Apply and close the Select by Attributes window. View the results of the attribute query.
- In the attribute table, click the Switch Selection button to de-select the INOLA address points and select address points within UNINCORPORATED.

The screenshot shows a window titled 'Table' with a toolbar at the top. Below the toolbar is a table titled 'ADDRESS_POINT'. The table has the following columns: OBJECTID *, Shape *, DiscrpAgID, RevDate, RevEditor, EffectDate, and ExpireDate. The data rows show various object IDs and their corresponding attributes. A status bar at the bottom indicates '(821 out of 2754 Selected)'.

OBJECTID *	Shape *	DiscrpAgID	RevDate	RevEditor	EffectDate	ExpireDate
171	Point ZM	<Null>	10/8/2020 7:17:58 PM	JDOE	<Null>	<Null>
172	Point ZM	<Null>	10/8/2020 7:17:58 PM	JDOE	<Null>	<Null>
173	Point ZM	<Null>	10/8/2020 7:17:58 PM	JDOE	<Null>	<Null>
174	Point ZM	<Null>	10/8/2020 7:17:58 PM	JDOE	<Null>	<Null>
248	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
249	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
250	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
251	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
252	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
253	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
254	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
255	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
256	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
257	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>
258	Point ZM	<Null>	10/8/2020 7:18:35 PM	JDOE	<Null>	<Null>

At the bottom of the window, there is a status bar that reads '(821 out of 2754 Selected)' and a button labeled 'ADDRESS_POINT'.

NOTES:

Editing Geometry and Attributes

- Turn on the Editor toolbar
- Click Editor, Start Editing to go into an editing session
 - Note: An edit session can also be initiated by right clicking a layer within the Table of Contents
- Click the Editor button, scroll down to Editing Windows, and click Create Features. This window should be docked on the side of the screen.
- Click the Editor button, scroll down to Editing Windows, and click Attributes to turn on the Attribute editing window
 - Select ADDRESS_POINT and click in the map to place a point
 - The attributes for the new address point are ready for population in the Attributes window
 - Add the following address attribute information in the new address point:
 - » 123 N Main St Apt A Inola, OK USA
 - Select ROAD_CENTERLINE and create the geometry for a road centerline
 - The attributes for the new road centerline are ready for population in the Attributes window
 - Add the following attributes for the new road centerline:
 - » N Main St Inola, OK USA Range 100-127
- Creating and Editing boundaries
 - Create the geometry for an ESN polygon
 - Add the following attributes to the ESN:
 - » ESN 123

NOTES:

Class Exercises

1. Select all Road Centerlines that with 'MSAGComm_L' values of 'MAYES COUNTY'.
2. Select all Address Points that are within ESN polygon 6216. Next, remove from selection Address Points that have City equal to 'UNINCORPORATED'.
3. Select a Road Centerline that appears to be a cul-de-sac. On editor toolbar, choose Edit Vertices, drag the endpoint to extend the road geometry.
4. Select a Road Centerline, on editor toolbar choose Reshape Feature Tool. Click on the selected RCL, next click within the map to place additional vertices to reshape the segment. Double click the selected road to end the drawing and finish the reshape.
5. Select ESZ polygon with ESN 6216. Zoom to the border of the polygon and choose the Cut Polygons Tool. Click on the selected polygon edge, next click within the map to place additional vertices to cut the polygon. Once area has been outlined, double click the selected polygon edge to finish the cut.
 - Select the newly created cut feature – open the attribute table. What do you notice?
 - Select the newly created cut feature and the neighboring ESN polygon 6204 – Merge the polygons together to create a single feature.
6. Select a Road Centerline, on editor toolbar choose Split Tool. Double click on the selected segment to split the feature at that location.
 - Select both the created split segments – open the attribute table. What do you notice?

NOTES:

Best Practices for NG9-1-1 GIS Data Management

- Digitize roads in the direction of increasing addressing
- For unaddressed roads, digitize in the direction of travel or increasing mile marker
- Split road centerlines at:
 - Road centerline intersections
 - Boundaries (jurisdictional/community, ESN, ESB, etc.)
 - Change in street name or community
- When road centerline geometry is adjusted, verify and update ranges to avoid creating overlaps
- Snap road centerlines at boundaries
- Use a consistent method for address placement (structure is recommended for NG9-1-1)
- Maintain subaddressing fields
- Ensure clean topology among PSAP, Provisioning, and ESB boundaries
- Follow the State's process for adjusting PSAP or municipal boundaries
- Populate all fields when possible, not just Mandatory fields
- Maintain attributes consistently between layers
- Implement the use of domains for fields with defined values to reduce discrepancies
- Maintain and track all changes through a unique ID and ensure they remain unique
- Consistently refer to the State's data model and their latest releases, ensuring your data field lengths and types are consistent with any changes
- Maintain and frequently update annexations and their relative attributes in your data, as incorporated municipality values are required to be maintained by the schema
- Practice a holistic editing approach – when a feature is edited in one layer, be mindful how changes may impact associated layers
- In addition to running validations through the NG9-1-1 GIS Toolkit, it's recommended to develop an internal QA/QC process and implement practices at the end each editing day

NOTES:



MODULE 5: PREPARING GIS DATA FOR NG9-1-1

OK NG9-1-1 GIS Data Standard

OK NG9-1-1 GIS Toolkit

- Downloading and resources
- Building the NG9-1-1 compliant GDB
- Field mapping
- Standardization tools
- QC tools
- Validations

NOTES:
