

# STATEWIDE NG9-1-1 TRAINING

## OK NG9-1-1 GIS TOOLKIT V3 TRAINING COURSE

### OVERVIEW

#### About this Exercise

The Oklahoma NG9-1-1 Toolkit is a set of tools intended to assist users for preparing their GIS data for NG9-1-1. The Toolkit is meant to be approached like a toolkit in real life; as each user's data is unique so will the approach to NG9-1-1 readiness. Many tools may be executed in different orders if the parameters are met.

#### **Always consult the 'ReadMe' for additional information**

This exercise is a suggested workflow which is fully customizable by each end user. The topics covered in this exercise are centered around the following areas:

- Section 1: Transitioning Standards Version 2.2 to Version 3 NG9-1-1 compliant geodatabase
- Section 2: Data preparation and standardization with enhancement tools
- Section 3: Validation and geometry data quality assessments

#### Helpful Links

##### **OK GIS Standard, Toolkit Manual, and Toolkit Download**

[http://www.okmaps.onenet.net/address\\_standards.htm](http://www.okmaps.onenet.net/address_standards.htm)

##### **State of Oklahoma Data**

<https://okmaps.org/OGI/search.aspx>

#### Preparing Data for NG9-1-1

**The Toolkit can be downloaded from the link posted above in Helpful Links. Unzip the Toolkit but leave it in its native folder structure. This is critical to preserve functionality. Review the 'Readme' location and documentation before running the toolkit.**

Scenario: We have GIS data which has been managed in OK NG9-1-1 Standards Version 2.2 which is our native schema. We need to transition this data to OK NG9-1-1 Standards Version 3. All required data layers are in a geodatabase.

- ADDRESS\_POINT
- DISCREPANCYAGENCY\_BOUNDARY\*
- ESB\_EMS\_BOUNDARY
- ESB\_FIRE\_BOUNDARY
- ESB\_LAW\_BOUNDARY
- ESZ\_BOUNDARY
- PSAP\_BOUNDARY\*
- ROAD\_CENTERLINE

*\*These layers are managed by the State and downloaded from the link posted above in Helpful Links.*

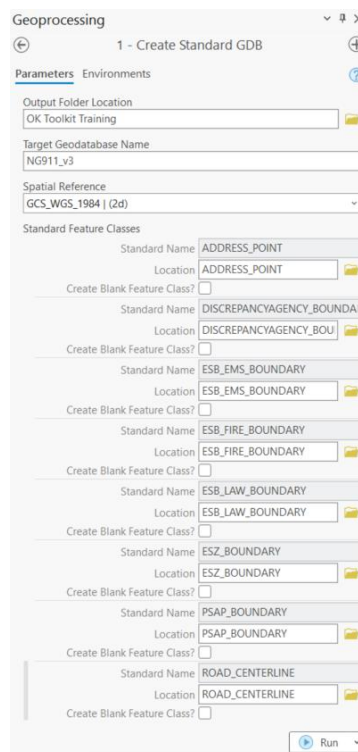
## SECTION 1: TRANSITIONING STANDARDS VERSION 2.2 TO VERSION 3 NG9-1-1 COMPLIANT GEODATABASE

### Create Standard GDB

Create Standard GDB creates a geodatabase with Standards-compliant feature datasets and domains. Create Standard GDB can also create feature classes and bring existing Standards-compliant data into the geodatabase.

Starting data is Standard Version 2.2 compliant. In this step, the goal is to build a Version 3 compliant geodatabase and bring existing data into the new geodatabase.

- Open Create Standard GDB Tool
- Output Folder Location: OK Toolkit Training (folder for the new geodatabase)
- Target Geodatabase Name: NG911\_v3 (the Standards-compliant spatial reference is already selected)
- We will use the parameter boxes to import the Version 2.2 feature classes
- Point to the correct location for each data set



- Click **Run**

The process completes with warnings. Click View Details in the tool to explore the messages. Open the attribute tables of the newly created feature classes, which fields do you notice did not transfer? Discuss the results.

**The new geodatabase NG911\_v3.gdb has been created. Examine the contents. NG911\_v3.gdb is now within Version 3 schema.**

## Field Mapping

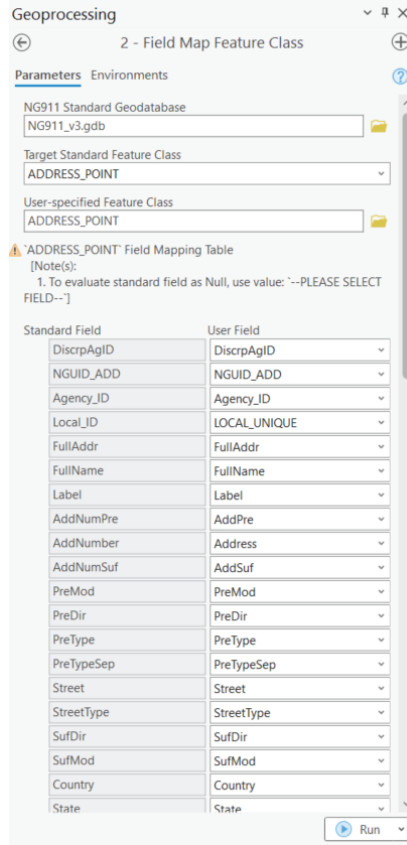
As discussed, using Create Standard GDB and allowing the tool to field map the existing feature classes **will only field map the field names the new standard can recognize**. There have been some field name changes between Standard v2.2 and v3. The alternative option instead of having the feature classes created by the Create Standard GDB tool would be to use the Field Mapping Feature Class option to individually field map the layers.

Additionally, as discussed, Version 3 contains a field for a locally maintained unique ID (Local\_ID). In this exercise, we will field map the locally maintained ID from Version 2.2. Although the Version 2.2 schema did not accommodate a locally maintained unique ID, one has been added for this exercise, named LOCAL\_UNIQUE.

Field map LOCAL\_UNIQUE from the Version 2.2 schema to the Version 3 schema and any other fields that have had field name changes between standards:

- Delete the previous field mapped ADDRESS\_POINT layer from the NG911\_v3.gdb
- Open the Field Map Feature Class tool
  - NG911 Standard Geodatabase: NG911\_v3.gdb
  - Target Standard Feature Class: ADDRESS\_POINT
  - User-specified Feature Class: Navigate to OK\_v2Standards.gdb and select ADDRESS\_POINT
  - For the Standard Field Local\_ID, click the drop down and select LOCAL\_UNIQUE
  - Select any other field that did not automatically populate – AddPre, Address, AddSuf
- Click **Run**

Note, that any source field names that are identical to Standards-compliant fields will be automatically populated. If source data fields are not provided in the field mapping, those fields will be created with Null values. Also, field names have changed in Version 3. **Review the field mapping carefully!**

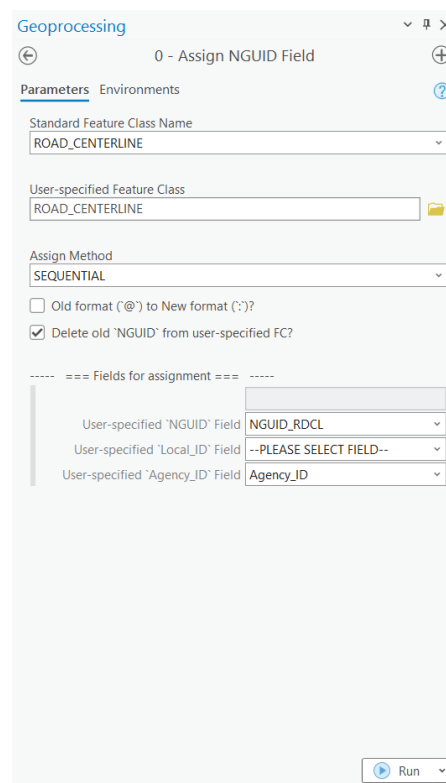


**The Version 2.2 Standards-compliant ADDRESS\_POINT feature class is now field mapped into Version 3 NG911\_v3.gdb. Examine the attribute table for ADDRESS\_POINT.**

## Assign NGUID Field

Every record within every NG9-1-1 data layer requires an NGUID (NENA Globally Unique ID). Use Assign NGUID Field within Prep toolset to populate this value.

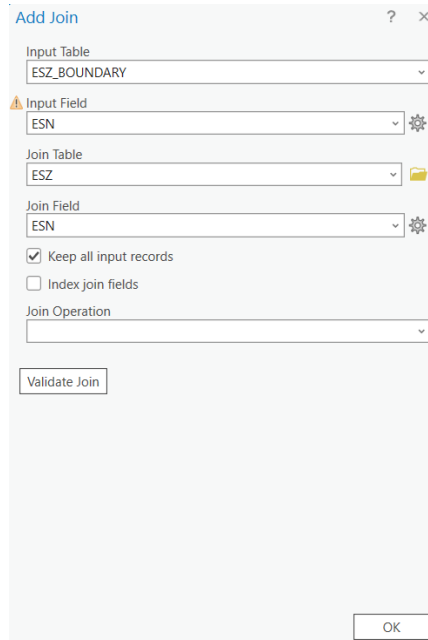
- Open the **Assign NGUID** tool
- Standard Feature Class Name: ROAD\_CENTERLINE
- User-specified Feature Class: ROAD\_CENTERLINE (from NG911\_v3.gdb)
- Assign Method: Sequential
  - Leave the box checked to delete the old NGUID from the user-specified feature class
- User-specified NGUID field: NGUID\_RDCL
- User-specified Agency\_ID field: Agency\_ID



- Click **Run**
- Next, we will calculate using a Local\_ID
  - Standard Feature Class Name: ADDRESS\_POINT
  - User-specified Feature Class: ADDRESS\_POINT (from NG911\_v3.gdb)
  - Assign Method: Local\_ID
    - Leave the box checked to delete the old NGUID from the user-specified feature class
  - User-specified NGUID field: NGUID\_ADD
  - User-specified Local\_ID field: LOCAL\_UNIQUE
  - User-specified Agency\_ID field: Agency\_ID

## Create Standard ESZ & ESB Feature Classes

Version 3 of the Standard now includes service types FIRE, POLICE, EMS as optional fields within ESZ\_BOUNDARY. To populate these values, join the ESN from ESZ in the Version 2 standard with ESN from Version 3.



The screenshot shows the 'Add Join' dialog box with the following settings:

- Input Table: ESZ\_BOUNDARY
- Input Field: ESN
- Join Table: ESZ
- Join Field: ESN
- Keep all input records
- Index join fields
- Join Operation: (empty dropdown)
- Buttons: Validate Join, OK

**If the ESZ data does not define service types in separate fields, choose one of the following options:**

If one or more ESBs exist:

Use the ESB field mapping tools for each service type. If any ESBs are missing, create the missing feature class during Create GDB or run Add Blank FCs.

If service types are in one field:

If the ESZ service types are defined in one field, the user should do a select by service type and export individual feature classes then perform ESB field mapping.

If the service type is unknown:

If the service type within the ESZ layer is unknown, the GIS staff should work with the PSAP authority for assistance defining the ESZ using the information in the attribute table or by geometry.

If the user has no ESZs:

If no ESZs exist, GIS staff should work with the PSAP to define and create them.

## SECTION 2: DATA PREPARATION AND STANDARDIZATION WITH ENHANCEMENT TOOLS

### POPULATE MANDATORY FIELDS

The next step is to populate data within the Mandatory fields of your created NG911\_v3.gdb.

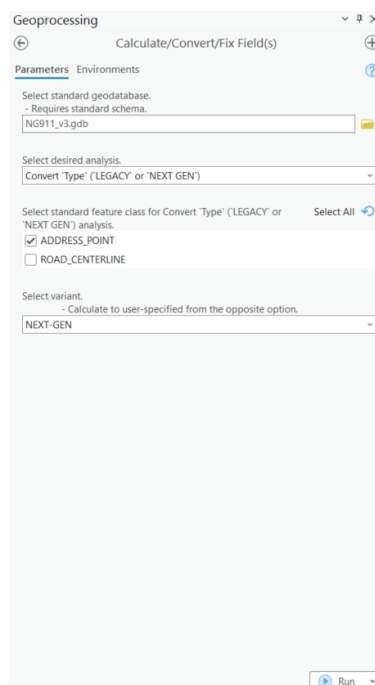
The Toolkit has several tools which populate some fields in the data. However, some will need to be populated manually. For this exercise, we are only populating fields within two feature classes.

- Open ArcGIS Pro and add **ADDRESS\_POINT** from *NG911\_v3.gdb* to the map
- Open the attribute table and scroll over to TopoExcept. This is a new field included in ADDRESS\_POINT in Version 3
- Field Calculate the value to NO\_EXCEPTION. As this is a domain, it is recommended to use the **Attributes pane** to populate this field.
- Review any other fields within the schema that are mandatory and may need populated.

### Convert Type and Direction

Calculate/Convert/Fix Fields is a set of nested tools in the Toolkit. These tools help with standardization, field calculations, and conversions.

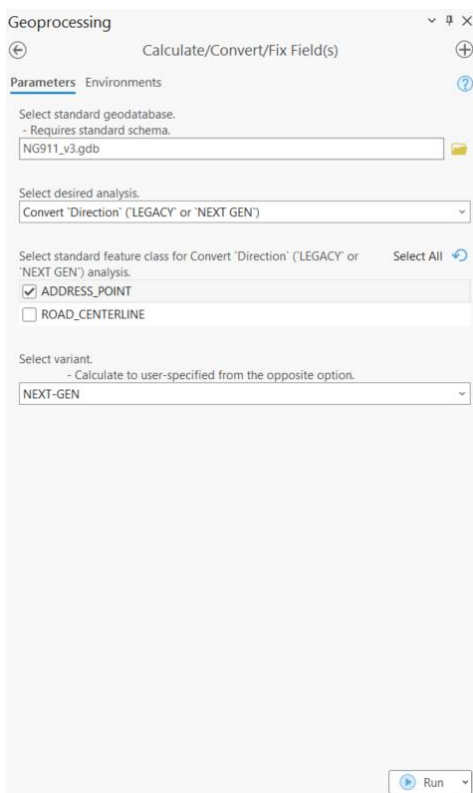
- Open Calculate/Convert/Fix Fields
- For Standard Geodatabase: NG911\_v3.gdb
- Desired Analysis: Convert 'Type' ('LEGACY' or 'NEXT GEN')
- Check the box for ADDRESS\_POINT
- Select variant: NEXT-GEN



- Click **Run**
- Open the attribute table for **ADDRESS\_POINT** and verify StreetType is populated

**Keep the tool open.**

- For Standard Geodatabase: NG911\_v3.gdb
- Desired Analysis: Convert 'Direction' ('LEGACY' or 'NEXT GEN')
- Check the box for ADDRESS\_POINT
- Select variant: NEXT-GEN

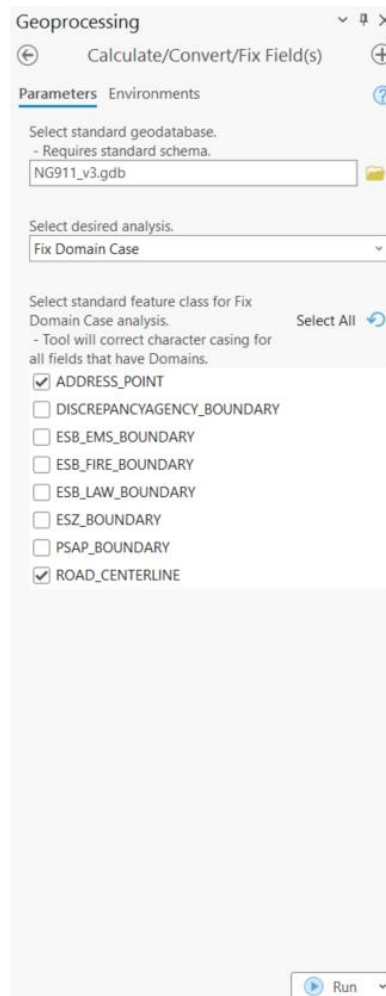


- Click **Run**
- Open the attribute table for **ADDRESS\_POINT** and verify PreDir is populated

## Fix Domain Case

Fix Domain Case adjusts any data with domain values and changes the case to UPPER. This is a good tool to use for QC and standardizing the data.

- Open **Fix Domain Case** and select NG911\_v3.gdb
- Select ADDRESS\_POINT and ROAD\_CENTERLINE
- Examine the fields Country, State, and County



- Click **OK** to run
- Open the attribute table for ADDRESS\_POINT and ROAD\_CENTERLINE and verify the values in the State and Country fields now have the proper domain values and are now UPPER case. What about County?

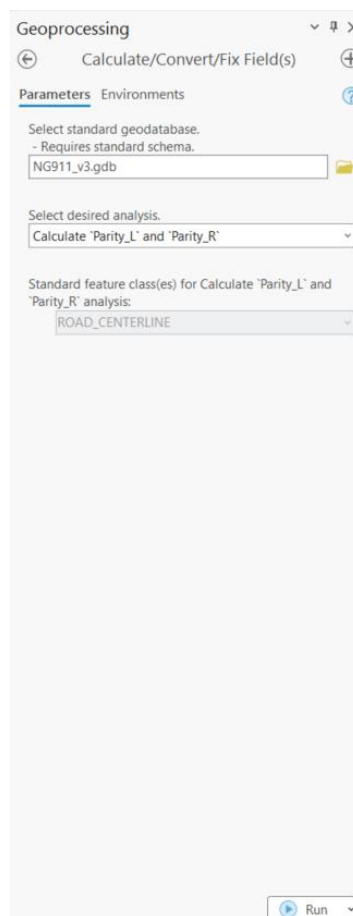
## Calculate 'PARITY\_L' and 'PARITY\_R'

Calculates the Parity\_L and Parity\_R fields within ROAD\_CENTERLINE by referencing the current Left and Right range values.

Parity represents the even or odd property of the address number range on the Left or Right side of the road segment relative to the FROM Node.

This is a field that has been modified between Version 2.2 and Version 3 of the standard. The previous domain was one character representing O=Odd; E=Even; B=Both; Z=Address Range 0-0. Now in Version 3, the fields are now length of 4 characters with values ODD, EVEN, BOTH, or ZERO.

- For Standard Geodatabase: NG911\_v3.gdb
- Desired Analysis: Calculate 'Parity\_L' and 'Parity\_R'
- This tool can only be run on ROAD\_CENTERLINE, so that feature class is automatically populated
- NOTE: Ensure the attribute table is closed. This may impact tool functionality.

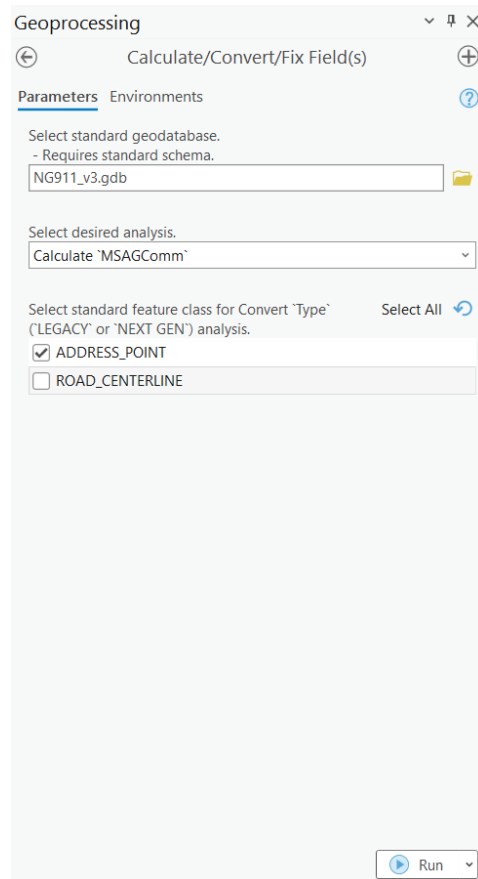


- Click **Run**
- Open the attribute table for **ROAD\_CENTERLINE** and **confirm Parity\_L and Parity\_R** fields are populated with the proper domain values

## Calculate 'MSAGComm'

Tool will populate missing MSAG Community values with the associated CITY field

- Select **Calculate MSAGComm**
- Select NG911\_v3.gdb
- Check ADDRESS\_POINT



- Click **Run**

## Calculate 'FullName' and/or 'LgcyFulSt'

- Select Standard Geodatabase: *NG911\_v3.gdb*
- Desired Analysis: Calculate 'FullName' and/or 'LgcyFulSt'
- Check the boxes for ADDRESS\_POINT and ROAD\_CENTERLINE
- Check the boxes for the NEXT-GEN and LEGACY variants

Geoprocessing

Calculate/Convert/Fix Field(s)

Parameters Environments

Select standard geodatabase.  
- Requires standard schema.  
NG911\_v3.gdb

Select desired analysis.  
Calculate 'FullName' and/or 'LgcyFulSt'

Select standard feature class for Calculate 'FullName' and/or 'LgcyFulSt' analysis. Select All

ADDRESS\_POINT

ROAD\_CENTERLINE

Select variant. Select All

NEXT-GEN

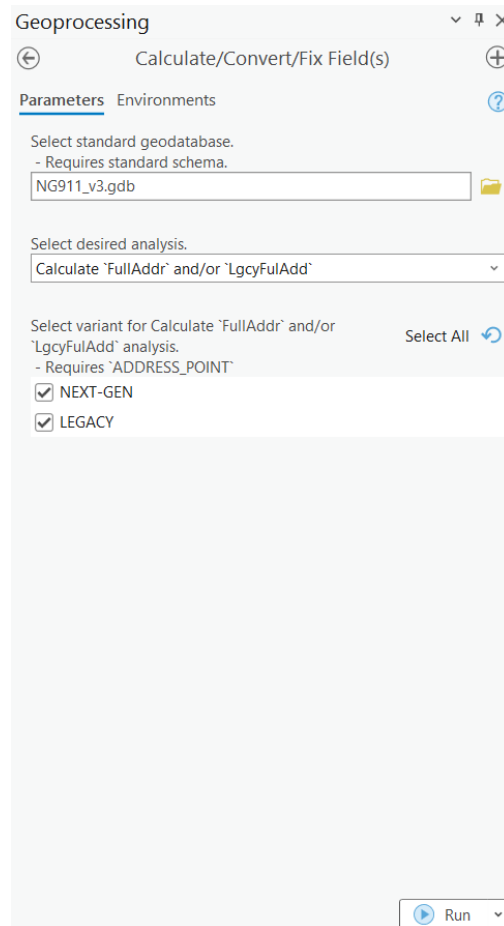
LEGACY

Run

- Click **Run**
- Open the attribute tables for both feature classes to ensure the fields have been populated

## Calculate 'FullAddr' and/or 'LgcyFulAdd'

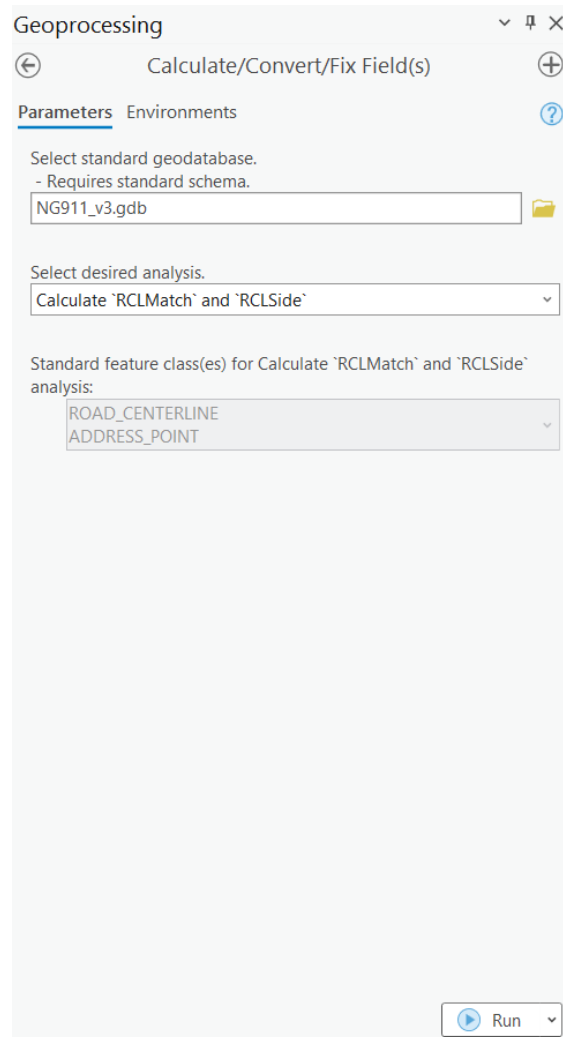
- Select Standard Geodatabase: *NG911\_v3.gdb*
- Desired Analysis: Calculate 'FullAddr' and/or 'LgcyFulAdd'
- Check the boxes for the NEXT-GEN and LEGACY variants



- Click **Run**
- Open the attribute table for ADDRESS\_POINTS and verify the fields have been calculated

## Calculate 'RCLMatch' and 'RCLSide'

- Select Standard Geodatabase: *NG911\_v3.gdb*
- Desired Analysis: Calculate "RCLMatch" and 'RCLSide'



- Click **Run**
- Open the attribute table for ADDRESS\_POINT and verify RCLMatch and RCLSide fields are populated

## Add Topology

Creates and adds layers and rules to topology. Topology rules included are listed below. Reference the 'ReadMe' for further information.

**Polygon Layer Rules** - All polygon feature classes must individually conform to the rule:

- Must Not Overlap (Area)

**ESB and PSAP Layer Rules** - The ESB\_EMS\_BOUNDARY, ESB\_FIRE\_BOUNDARY, ESB\_LAW\_BOUNDARY, and PSAP\_BOUNDARY must individually conform to the rule:

- Must Not Have Gaps (Area)

**ROAD\_CENTERLINE Layer Rules** - The ROAD\_CENTERLINE layer must conform to the following rules:

- Must Not Overlap (Line)
- Must Not Have Dangles (Line)
- Must Not Self-Overlap (Line)
- Must Not Self-Intersect (Line)
- Must Be Single Part (Line)

*NOTE: The rule(s) in italics may be marked as exceptions on a per-feature basis.*

### Rules Involving the DISCREPANCYAGENCY\_BOUNDARY Layer

- ADDRESS\_POINT - Must Be Properly Inside (Point-Area)
- *ROAD\_CENTERLINE - Must Be Inside (Line-Area)*
- ESB\_EMS\_BOUNDARY - Must Cover Each Other (Area-Area)
- ESB\_FIRE\_BOUNDARY - Must Cover Each Other (Area-Area)
- ESB\_LAW\_BOUNDARY - Must Cover Each Other (Area-Area)
- ESZ\_BOUNDARY - Must Cover Each Other (Area-Area)
- PSAP\_BOUNDARY - Must Cover Each Other (Area-Area)

*NOTE: The rule(s) in italics may be marked as exceptions on a per-feature basis.*

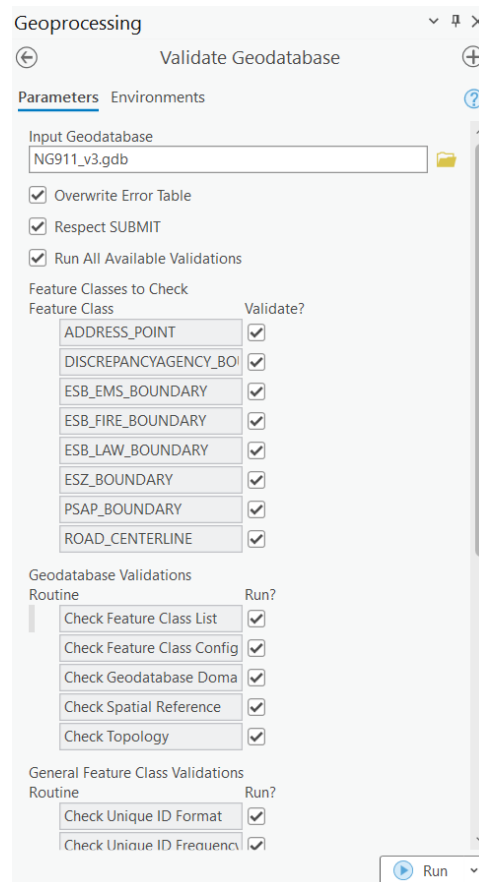
### See the Tool 'ReadMe' for more information about topology rules

- Open **Add Topology**
- Select *NG911\_v3.gdb*
- Check the box to Validate
- Click **Run**
- Drag and drop NG911\_Topology into the map. All feature classes participating in the topology are automatically added.
- Review the Error Inspector topology errors

## SECTION 3: VALIDATION AND GEOMETRY DATA QUALITY ASSESSMENTS

### Validate Geodatabase

- Input Geodatabase: *NG911\_v3.gdb*
- Check the boxes for Overwrite Error Table, Respect Submit, and Run All Available Validations
- All validations will be checked – scroll to review



- Click **Run**
- Review Error Glossary within Toolkit 'ReadMe' document