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Oklahoma NG9-1-1 GIS Toolkit

USER MANUAL

Prepared by:

DATAMARK 

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Prepared on behalf the Oklahoma 9-1-1 Management Authority and the Office of Geographic Information by the DATAMARK Team of Michael Baker International, Inc.

Toolkit Version

This user manual supports version 6.1 of the Oklahoma NG9-1-1 GIS Toolkit.

Technical Support

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Introduction to the Oklahoma NG9-1-1 GIS Toolkit

Intended Use

The Oklahoma Next Generation 9-1-1 GIS Toolkit is a collection of GIS data toolsets developed to enable local, county, and state GIS stakeholders throughout Oklahoma to prepare, compare, validate, adjust, and submit locally managed GIS data to a statewide repository in compliance with Oklahoma's Next Generation 9-1-1 (NG9-1-1) data standards.

Structure of the Toolkit

The Oklahoma Next Generation 9-1-1 GIS Toolkit includes GIS data management tools used by local, county, and state GIS and public safety personnel. The Toolkit is made up of the following toolsets: **Okprep, Adjustment, Comparison, Enhancement, Submission, Validation**

State of Oklahoma Next Generation 9-1-1 GIS Overview

Oklahoma NG9-1-1 and Address Standard

NG9-1-1 relies heavily on accurate, reliable, and standards-driven GIS data for call location and call routing. The Oklahoma NG9-1-1 and Address Standard establishes mandatory address standards and requirements for GIS data used in 9-1-1 and NG9-1-1 applications. The Standard is driven by the state's NG9-1-1 GIS and addressing requirements and complies NENA NG9-1-1 standards and requirements. All GIS data used in NG9-1-1 shall conform to the requirements which are defined and described in the Standard.

State of Oklahoma NG9-1-1/GIS Repository

The state of Oklahoma has established and maintains a NG9-1-1 and GIS data repository which aggregates data managed by local GIS authorities into a statewide dataset used to provision data to the state's Emergency Services IP network (ESInet). The NG9-1-1 GIS Toolkit is an essential element for GIS authorities and public safety agencies throughout the state to edit and submit NG9-1-1 GIS data to the State of Oklahoma NG9-1-1/GIS Repository.

Links to NG9-1-1 and Address Standard Information, Documentation, and Schema

[NG9-1-1 and Address Standard Web Page](#)

[NG9-1-1 and Address Standard Document](#)

[NG9-1-1 and Address Standard Schema](#)

GIS Toolkit Requirements and Setup

Software Requirements

ArcGIS

Version 6.1 of the Oklahoma NG9-1-1 GIS Toolkit requires a license of Esri ArcGIS to be installed on the user's workstation. Tools have been tested for use in **ArcGIS Desktop 10.7** and may or may not function properly with other versions of ArcGIS.

Python

The GIS Toolkit requires Python to be installed on the user's workstation along with the ArcPy package, which is included with the user's ArcGIS license. A Standard license is required for Topology, and an Advanced license is required for Check Road ESN Advanced. If these functions and features are not required, a Basic license must be installed. Python 2.7 is installed with ArcGIS 10.7; the Toolkit may or may not function properly with other versions of Python.

GIS Toolkit Setup

Download the NG9-1-1 GIS Toolkit to the User Workstation

The Oklahoma NG9-1-1 GIS Toolkit is available for download from the Oklahoma Geographic Information Council. The Toolkit is delivered as a zip file containing the tools and related documentation.

Unzip the NG9-1-1 GIS Toolkit

Unzip the NG9-1-1 GIS Toolkit and save it to the user workstation. All files and folders must remain in their original structure for proper operation of the NG9-1-1 GIS Toolkit.

Extract the NG9-1-1 GIS Toolkit to a Local Folder

Once the NG9-1-1 GIS Toolkit has been saved to the user workstation, extract it to a local folder on the workstation.

Create a Folder Connection to ArcGIS


Once the NG9-1-1 GIS Toolkit has been extracted to a local folder on the user workstation, create a folder connection to the toolkit through ArcCatalog via ArcGIS Desktop.

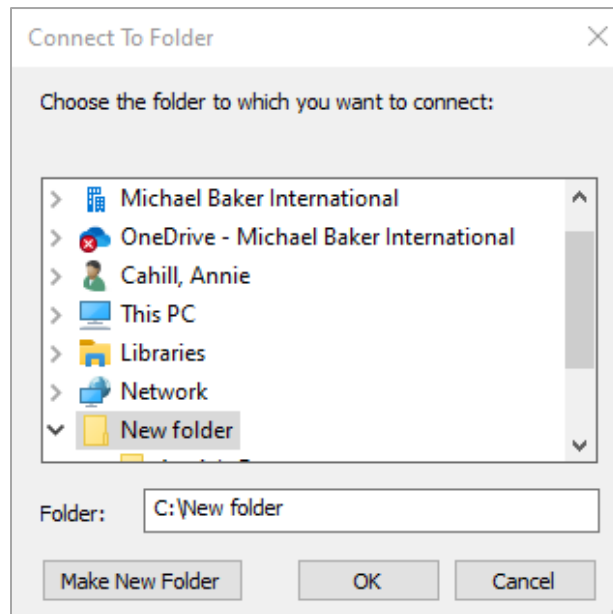
Note: Datasets must be inactive during setup of the NG9-1-1 GIS Toolkit and when performing toolkit operations.

Getting Started with the NG9-1-1 GIS Toolkit

Accessing the Toolkit

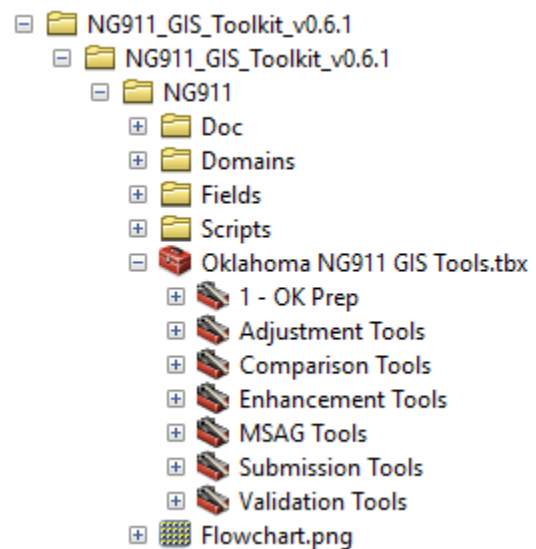
The Toolkit is accessed using ArcCatalog or through the ArcCatalog connection in ArcMap.

Make a folder connection in ArcCatalog or ArcMap by clicking the **Connect to Folder** button  or by right-clicking on Folder Connections in the Catalog Tree and clicking Connect to Folder. Choose the folder storage location and click **OK**.



When the connection is made, the new folder containing the Toolkit will appear in the Catalog Tree as shown in the figure to the right. Expand the new Toolkit folder structure to access the Toolkit. The Toolkit's download file contains several folders; everything in the toolkit folder must be left in its native structure to preserve its functionality.

The Toolkit file is named *Oklahoma NG911 GIS Tools.tbx* and represented with a red toolbox icon as shown in the figure to the right. Toolsets are nested within the toolbox and contain the individual GIS data tools used to modify and prepare your data for NG9-1-1. Following GIS best practices, do not modify the Toolkit folders' domains, fields, scripts, or any of their contents.



Note: This user manual will be updated with MSAG toolset instructions once the tools are finalized.

Understanding Local GIS Data

Assessing Local GIS Data Before Adopting State Standards

Performing a thorough assessment of local and regional GIS data before working on it to prepare for NG9-1-1 is a critical step that is often overlooked by GIS authorities. GIS data managers and editors should develop a complete understanding of how existing GIS data supports current business needs, and identify gaps to be addressed to bring their data into compliance with the Oklahoma NG9-1-1 and Address Standard. This effort is unique for each GIS authority and necessary to inform the decisions to edit data to adopt the state's schema and field values, and to determine the level of effort required to bring data into compliance.

Performing Initial Field Mapping Prior to Deploying the Toolkit

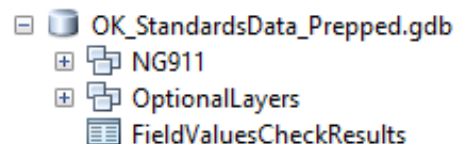
The NG9-1-1 GIS Toolkit provides GIS authorities with field mapping tools for each data layer required by the Standard. However, GIS best practices advise performing an initial field mapping 'by hand' using Excel or another manual application prior to deploying the Okprep Field Mapping Tools. This will allow local GIS data managers and editors to make notes about how each field is to be mapped, note the purpose of each field, and identify existing business requirements for the data that may be impacted.

Viewing Data Results

Viewing Data in the FieldValuesCheckResults and TemplateCheckResults Tables

A number of tools in the NG9-1-1 GIS Toolkit will report their results in FieldValuesCheckResults and/or TemplateCheckResults tables following successful completion of the tool run. This data is crucial to identifying anomalies in the data, the location within the data the anomaly was discovered, and the validation tool or check performed to identify it.

To view these results, select FieldValuesCheckResults in the Catalog Tree and click the Preview tab as shown in the figure to the right. Alternatively, the table can be viewed using ArcMap.



The FieldValuesCheckResults table contains the following fields:

FIELD NAME	DESCRIPTION
DATAFLAG	Date of the anomaly
DESCRIPTION	Description of the anomaly
LAYER	Layer in which the anomaly occurs
FIELD	Field in which the anomaly occurs, if applicable
FEATUREID	NGUID of the feature
CHECK	Validation or verification task performed by the tool

A screenshot of the FieldValuesCheckResults table with results from the Check Road ESN Values Tool is shown below.

OBJECTID *	DATEFLAG	DESCRIPTION	LAYER	FIELD	FEATUREID	CHECK
1	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_19@cog.acog.ok.gov	Check Road ESN Values
2	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_27@cog.acog.ok.gov	Check Road ESN Values
3	9/22/2021	Notice: Segment ESN_L value 6202 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_40@cog.acog.ok.gov	Check Road ESN Values
4	9/22/2021	Notice: Segment ESN_L value 6206 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_42@cog.acog.ok.gov	Check Road ESN Values
5	9/22/2021	Notice: Segment ESN_L value 6206 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_43@cog.acog.ok.gov	Check Road ESN Values
6	9/22/2021	Notice: Segment ESN_L value 6206 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_45@cog.acog.ok.gov	Check Road ESN Values
7	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_75@cog.acog.ok.gov	Check Road ESN Values
8	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_84@cog.acog.ok.gov	Check Road ESN Values
9	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_104@cog.acog.ok.gov	Check Road ESN Values
10	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_106@cog.acog.ok.gov	Check Road ESN Values
11	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_118@cog.acog.ok.gov	Check Road ESN Values
12	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_187@cog.acog.ok.gov	Check Road ESN Values
13	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_223@cog.acog.ok.gov	Check Road ESN Values
14	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_229@cog.acog.ok.gov	Check Road ESN Values
15	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_230@cog.acog.ok.gov	Check Road ESN Values
16	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_231@cog.acog.ok.gov	Check Road ESN Values
17	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_233@cog.acog.ok.gov	Check Road ESN Values
18	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_262@cog.acog.ok.gov	Check Road ESN Values
19	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_333@cog.acog.ok.gov	Check Road ESN Values
20	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_334@cog.acog.ok.gov	Check Road ESN Values
21	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_335@cog.acog.ok.gov	Check Road ESN Values
22	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_359@cog.acog.ok.gov	Check Road ESN Values
23	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_379@cog.acog.ok.gov	Check Road ESN Values
24	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_390@cog.acog.ok.gov	Check Road ESN Values
25	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_429@cog.acog.ok.gov	Check Road ESN Values
26	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_430@cog.acog.ok.gov	Check Road ESN Values
27	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_436@cog.acog.ok.gov	Check Road ESN Values
28	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_438@cog.acog.ok.gov	Check Road ESN Values
29	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_441@cog.acog.ok.gov	Check Road ESN Values
30	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_463@cog.acog.ok.gov	Check Road ESN Values
31	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_483@cog.acog.ok.gov	Check Road ESN Values
32	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_500@cog.acog.ok.gov	Check Road ESN Values
33	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_502@cog.acog.ok.gov	Check Road ESN Values
34	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_503@cog.acog.ok.gov	Check Road ESN Values
35	9/22/2021	Notice: Segment ESN_Lj Esn_R value 6206 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_526@cog.acog.ok.gov	Check Road ESN Values
36	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_27@cog.acog.ok.gov	Check Road ESN Values
37	9/22/2021	Notice: Segment ESN_Lj Esn_R value 6204 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_29@cog.acog.ok.gov	Check Road ESN Values
38	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_121@cog.acog.ok.gov	Check Road ESN Values
39	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_223@cog.acog.ok.gov	Check Road ESN Values
40	9/22/2021	Notice: Segment ESN_Lj Esn_R value 6204 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_273@cog.acog.ok.gov	Check Road ESN Values
41	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_322@cog.acog.ok.gov	Check Road ESN Values

To facilitate clean-up of the FieldValuesCheckResults table, GIS editors are encouraged to consider joining the FEATUREID field in FieldValuesCheckResults to the NGUID field in the NGUID of the corresponding feature class.

Clearing the FieldValuesCheckResults and TemplateCheckResults Tables

Multiple tools output data to the FieldValuesCheckResults and TemplateCheckResults tables, and successive runs of the same or different tools which output to these tables will cause data to be compounded within them. GIS editors are advised to clear these tables every time after a tool is run, the table is populated, and the tool results have been used to make changes or updates to the geodatabase.

The Validation Toolset includes the **Clear Results Table Tool** which is used to clear output results from FieldValuesCheckResults. Please refer to the tool's page in this manual for more information and instructions in its use.

Oklahoma NG9-1-1 GIS Data Processes

Local NG9-1-1 GIS Data Creation and Management

The State of Oklahoma's NG9-1-1 GIS data repository is built from data created by local PSAPs, counties, and GIS authorities, with each at different places on the path to NG9-1-1 readiness, highlighting there is no one-size-fits-all solution or approach to GIS data readiness.

Understanding the challenges presented to Oklahoma's GIS authorities, the Oklahoma NG9-1-1 and Address Standard and the NG9-1-1 GIS Toolkit enable GIS authorities to take existing GIS data from its current state and prepare it for the State of Oklahoma NG9-1-1/GIS Repository.

Understanding Current GIS Data, State Standards, and the NG9-1-1 GIS Toolkit

Understanding the current GIS data and GIS data management environment, in context with the new requirements placed on it by NG9-1-1, is paramount. Each agency and GIS authority must be prepared to assess its data to determine:

- Where it is on the path to NG9-1-1 GIS readiness
- The tools and workflows needed create and manage a NG9-1-1 geodatabase
- When its data is ready to be provisioned to the state repository

Oklahoma NG9-1-1 GIS Training

The Oklahoma 9-1-1 Management Authority has created a statewide NG9-1-1 GIS training program which delivers instruction in the standards, tools, and data management workflows and processes. Each agency and GIS authority is strongly encouraged to go through this training program before embarking on NG9-1-1 GIS transformation. Training class materials are available from the Authority and Statewide NG9-1-1 GIS Training Videos are available to view at any time for initial or refresher training.

NG9-1-1 GIS Processes and Workflows

The NG9-1-1 GIS Toolkit Workflow below outlines the major steps all agencies and GIS authorities must go through to prepare and transform their existing data for NG9-1-1. While there is no single process workflow to deploy the NG9-1-1 Toolkit, the workflow identifies the major steps to developing Standard-compliant data as well as how the Toolkit is used to validate and submit the NG9-1-1 geodatabase to the statewide repository.

Submitting Data to the Oklahoma NG9-1-1/GIS Repository

The Submission Tools toolset prepares data for submission to the Oklahoma NG9-1-1/GIS Repository. GIS data that meets the Oklahoma NG9-1-1 and Address Standard is submitted to the Repository in a .zip folder. Once the data is uploaded from the GIS authority, validated, and meets all of the Repository requirements, it is merged into OKMaps.

Instructions for using the Submission Tools toolset are included in this user manual. Please refer to the Oklahoma NG9-1-1/GIS Repository user guide for additional information and instructions for working with submitted data.

Resources for GIS Authorities Without Required NG9-1-1 Feature Classes

GIS authorities preparing GIS data for NG9-1-1 may take different approaches based on their existing data and its condition relative to the Oklahoma NG9-1-1 and Address Standard. Some GIS authorities may have some or all required layers where others may not have any of the datasets required by the Standard to support statewide NG9-1-1.

The NG9-1-1 GIS Toolkit is used to generate and validate the following feature classes:*

Address Points	Law Emergency Service Boundary
Road Centerlines	Fire Emergency Service Boundary
Emergency Service Zones (ESZs)	EMS Emergency Service Boundary

*Note: Discrepancy Agency and PSAP Boundary data is typically maintained and provided by the state and these feature classes are kept compliant with the Oklahoma NG9-1-1 and Addressing Standard.

For GIS authorities starting this process with few or none of the required feature classes, Standard-compliant layers may be generated using existing GIS data and the Okprep tools. The examples below demonstrate how Standard-compliant layers required for NG9-1-1 can be created using existing available information and resources provided in the NG9-1-1 GIS Toolkit.

Creating a New Feature Class from Existing Data and Field Mapping the Attributes to NG9-1-1 Schema

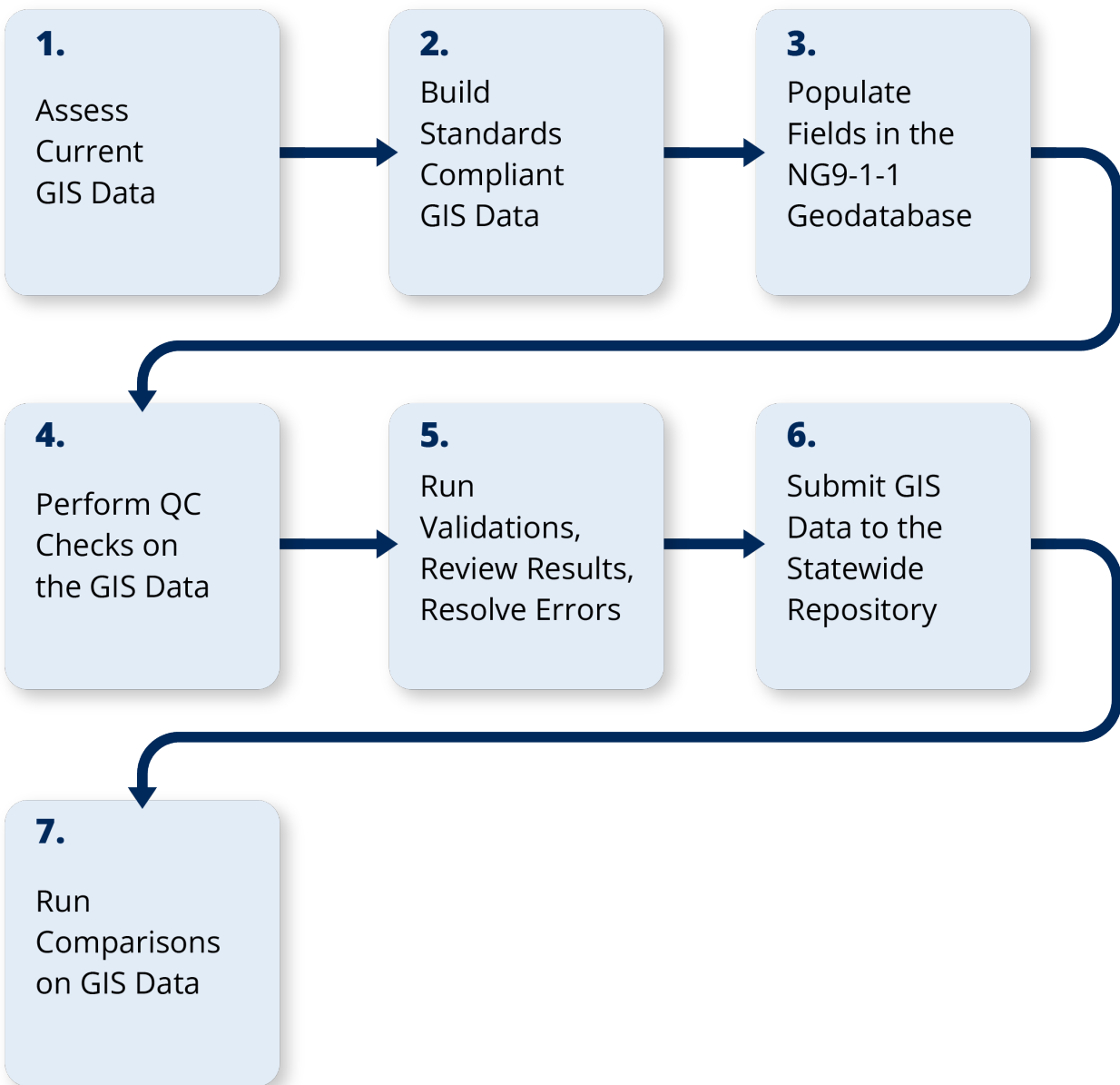
A new address point layer may be created using a parcel centroid. Once the address points are generated, the Okprep toolset's **Address Field Map** tool can be run on the new address point feature class to transform the attributes into the Standard-compliant schema. Once this is complete, the new Standard-compliant address point feature class is ready to be included in the NG9-1-1 geodatabase.

Creating a Blank New Feature Class in the Geodatabase then Populating and Validating It

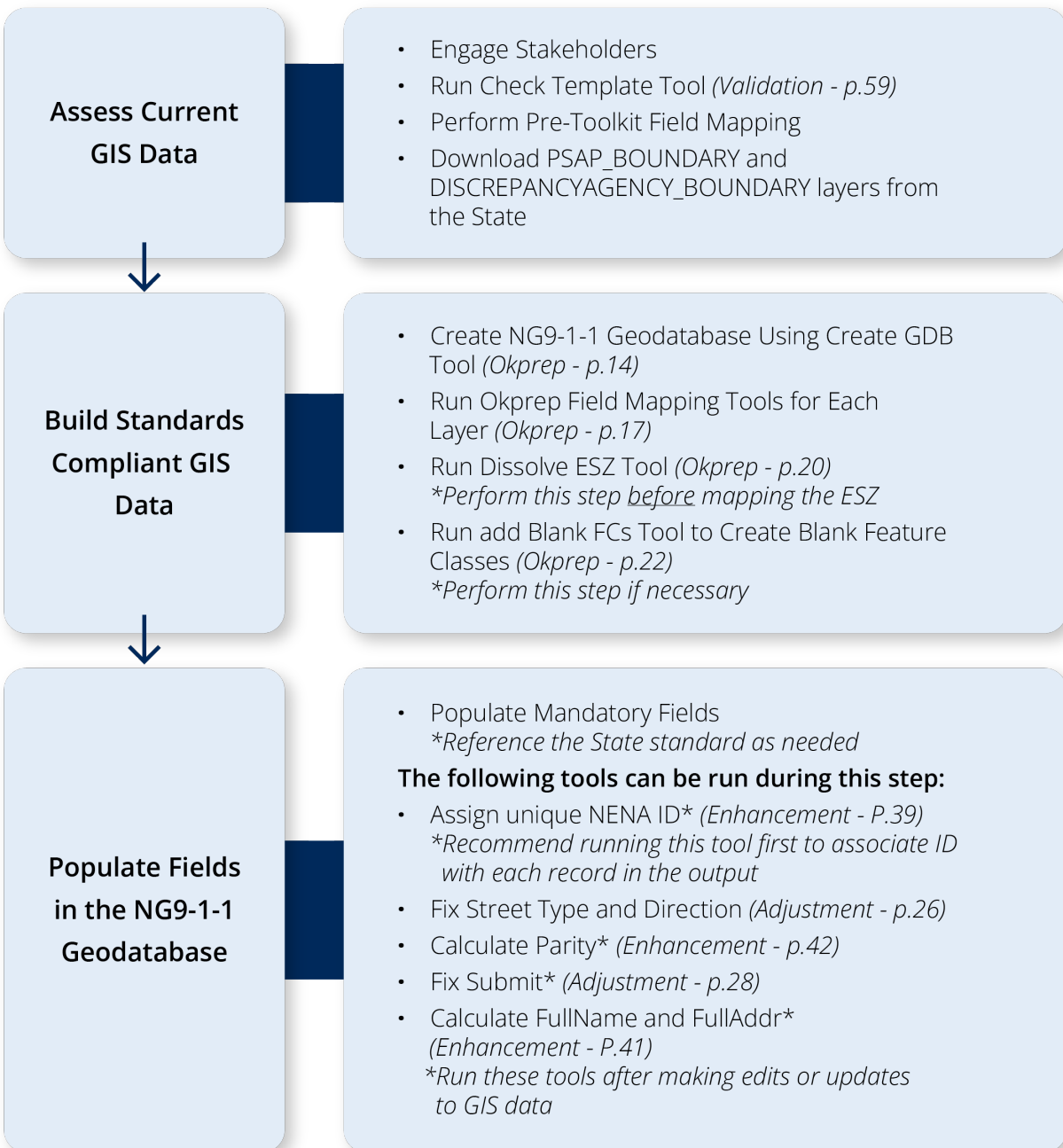
The Okprep Toolset also includes two tools that can be used to create a new blank feature class with Standard-compliant schema within the NG9-1-1 geodatabase. **Create GDB** can be used to create a blank feature class concurrently with the new geodatabase. **Add Blank FCs** can be used to create a new empty feature class within the geodatabase. Once created, the new feature classes can be populated and validated as part of the NG9-1-1 geodatabase.

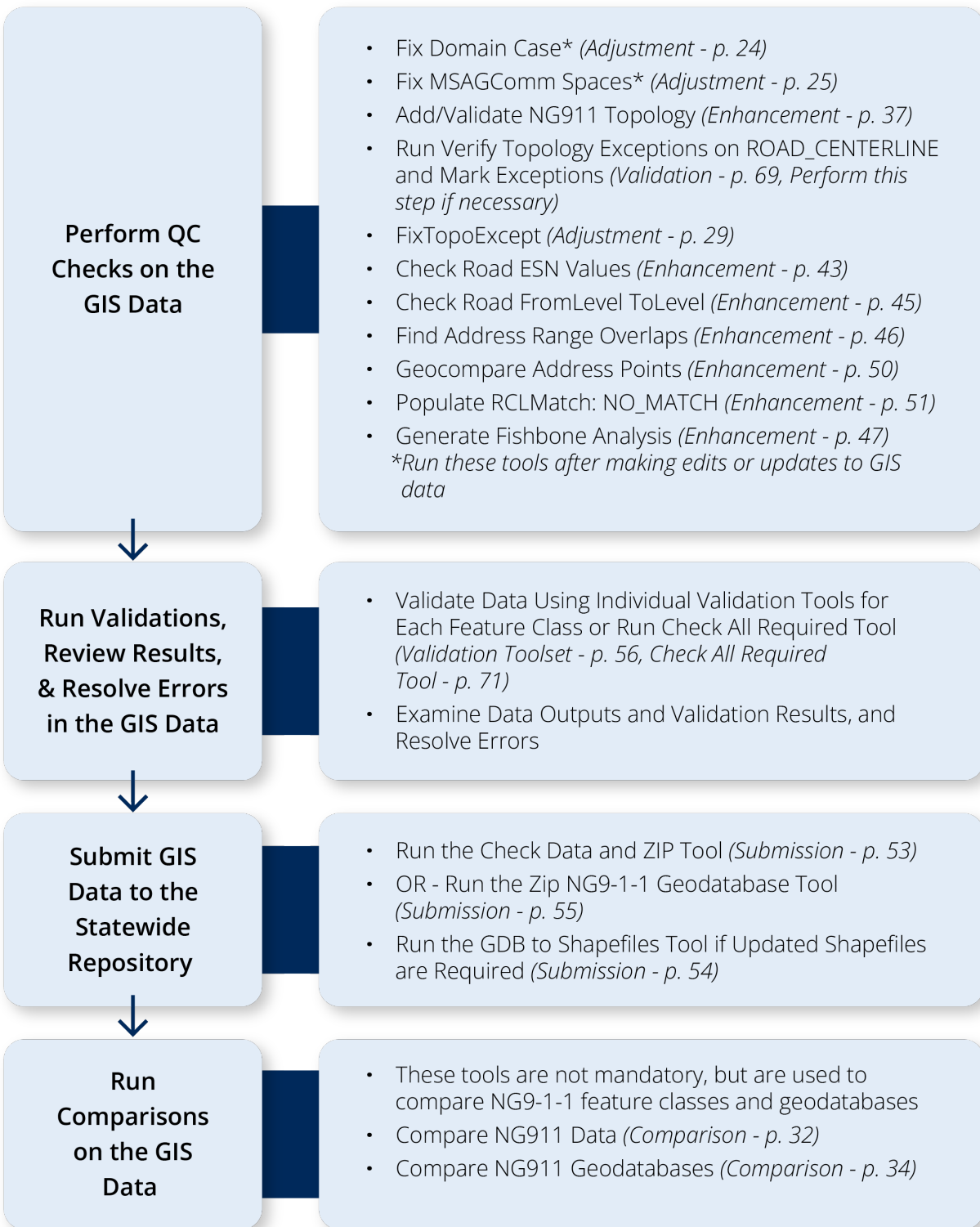
GIS authorities that require additional information, direction, and support after evaluating their data, working through Oklahoma NG9-1-1 GIS training resources, and reviewing the NG9-1-1 GIS Toolkit, should contact the Office of Geographic Information.

Oklahoma NG9-1-1 GIS Toolkit Workflow



Individual tools and process steps for each stage of the Oklahoma NG9-1-1 GIS Toolkit workflow are described in detail in the figures below.





Topology Rules for NG9-1-1 GIS Data

The Oklahoma NG9-1-1 and Address Standard requires a number of topological relationships to be maintained within and among various feature classes. Validating topology is performed using the Toolkit's topology check functions. These rules and exceptions are described below.

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 feature classes must individually conform to the rule:

Must Not Have Gaps (Area)

ROAD_CENTERLINE Layer Rules

The ROAD_CENTERLINE feature class 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)

* Rule may be marked as exception on a per-feature basis; see Exceptions.

DISCREPANCYAGENCY_BOUNDARY Layer Rules

The Standard requires the following relationships between NG9-1-1 feature classes and the DISCREPANCYAGENCY_BOUNDARY be maintained:

NG9-1-1 Feature Class	Relationship to DISCREPANCYAGENCY_BOUNDARY
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)

* Rule may be marked as exception on a per-feature basis, see Exceptions.

Exceptions to Oklahoma NG9-1-1 and Address Standard Topology Rules

The ROAD_CENTERLINE feature class includes the `TopoExcept` field, which allows the user to mark individual features as exempt from the *Must Not Have Dangles (Line)* and/or the *Must Be Inside (Line-Area)* rules. These exceptions will be accounted for when the **Verify Topology Exceptions** validation tool is run.

ROAD_CENTERLINE is the only feature class in which exceptions to the topology rules are allowed. As `TopoExcept` is a Mandatory field within the Standard, every record in the ROAD_CENTERLINE feature class requires a value in this field. GIS editors should give thoughtful consideration about how to resolve anomalies at the SDE level to facilitate ongoing data preparation and maintenance of the NG9-1-1 dataset.

ROAD_CENTERLINE exceptions are marked in the Mandatory field `TopoExcept` with one of the following values:

Feature is an Exception to *Must Not Have Dangles*

Selecting this value advises the validation toolset the road centerline is not a dangle error but exists in real life, such as a dead-end street or cul-de-sac.

Feature is an Exception to *Must be Inside Discrepancy Agency Boundary*

Selecting this value advises the validation toolset the road centerline is not an outside Discrepancy Agency Boundary error, but that the road centerline is maintained purposefully outside the boundary. For example, many PSAPs maintain road centerlines outside the Discrepancy Agency boundary for CAD or routing purposes.

Feature is an Exception to Both Topology Rules

Select this exception value when the feature is an exception to both topology rules described above. For example, choose this option for a dead-end street which is purposefully maintained as extending outside the Discrepancy Agency Boundary.

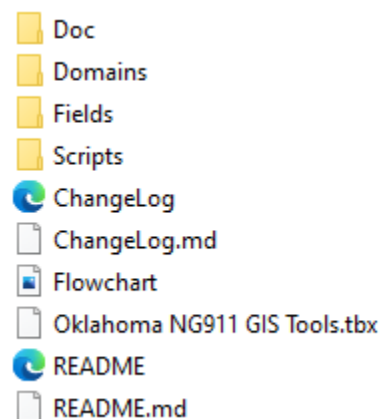
Feature is Not an Exception to the Topology Rules

Select this `TopoExcept` field value if there are no exceptions to the topology rules. This advises the validation toolset these features are not exceptions and should be validated against the Standard's topology rules. The **Fix TopoExcept** tool can be used to assist in updating the `TopoExcept` field; a description and instructions for this tool are provided in the Adjustment Toolset section of this user manual.

Change Log

The Oklahoma NG9-1-1 Toolkit includes a Change Log, provided as a supplementary document to track revisions, updates, additions, and deletions to the NG9-1-1 Toolkit.

The Change Log is maintained as an HTML document and is accessed by opening the **ChangeLog** file from the toolkit folder. The most current changes are shown at the top, followed by a list of historical changes over time.



Okprep Toolset

Overview

The Okprep toolset provides user-friendly tools for creating a standards-compliant geodatabase and converting existing data to comply with the schemas defined in the Oklahoma NG9-1-1 and Address Standard.

Okprep tools are used to map feature class fields to a new feature class with proper field names, types, lengths, and domains. Okprep tools are used to create a new geodatabase with a user-defined coordinate reference system and the correct domains from the domain files. This toolset enables users to ensure feature classes and the geodatabase to be submitted are formatted with the proper domains and field names.

Creating a Field Mapping Table Prior to Deploying the Toolkit

Users of the OK NG9-1-1 GIS Toolkit are strongly encouraged to create a field mapping table outside the toolkit to work through their field mapping requirements and develop a greater understanding of how their data will fit within the state's schema. This can be done in Excel or other applications used to create a tabular dataset that will be used to complete field mapping using the toolkit. The Oklahoma NG9-1-1 and Address Standard compliant schema is available for download from the Oklahoma Geographic Information Council, and a link is provided in the [Introduction to the Oklahoma NG9-1-1 GIS Toolkit](#) section of this manual.

Field and Attribute Population for Oklahoma NG9-1-1 GIS Data

Field mapping and attribute population, in alignment with the state's NG9-1-1 GIS requirements, may introduce new fields, schemas, and data standards that local agencies, counties, or councils of government may not be familiar with. Agencies or jurisdictions using the GIS Toolkit will be required to create all layers identified in the Oklahoma NG9-1-1 and Address Standard and populate them with their respective standards-compliant attribute data. Alternatively, existing data and layers will need to be field mapped or transformed into standards-compliant layers following the Oklahoma NG9-1-1 and Address Standard.

Create GDB Tool

The Create GDB tool is used to generate a geodatabase which complies with the Oklahoma NG9-1-1 and Address Standard for schema, coordinate system, and domains. The Create GDB tool is used to import data that already complies with the Standard and is used to create blank feature classes. Follow these steps to create a new standards-compliant geodatabase. The screenshot on the next page illustrates each of the tool's inputs and selections.

Create the Filename and Folder Location of the New Geodatabase

Follow these steps to begin the process of creating a new Standard-compliant geodatabase:

- Open the Create GDB tool
- Click the folder icon next to **Folder Location** to specify where the geodatabase is saved
- Create a name for the geodatabase a name in **Output GDB Name**

The Create GDB tool automatically populates **Spatial Reference** with the GCS_WGS_1984 coordinate system, following the Oklahoma NG9-1-1 and Address Standard.

Select the Feature Classes to be Imported and Created

Click the folder icon next to each feature class to select the feature class to be imported during the geodatabase creation process. The Create GDB tool supports the import of locally created and managed feature class datasets as well as state-maintained datasets such as the Discrepancy Agency and PSAP Boundary feature classes.

The Create GDB tool provides selections to import Standard-compliant feature classes for:

Address Point

Road Centerline

Discrepancy Agency

Emergency Service Zone (ESZ) Boundary

Emergency Service Boundary (ESB) Fire

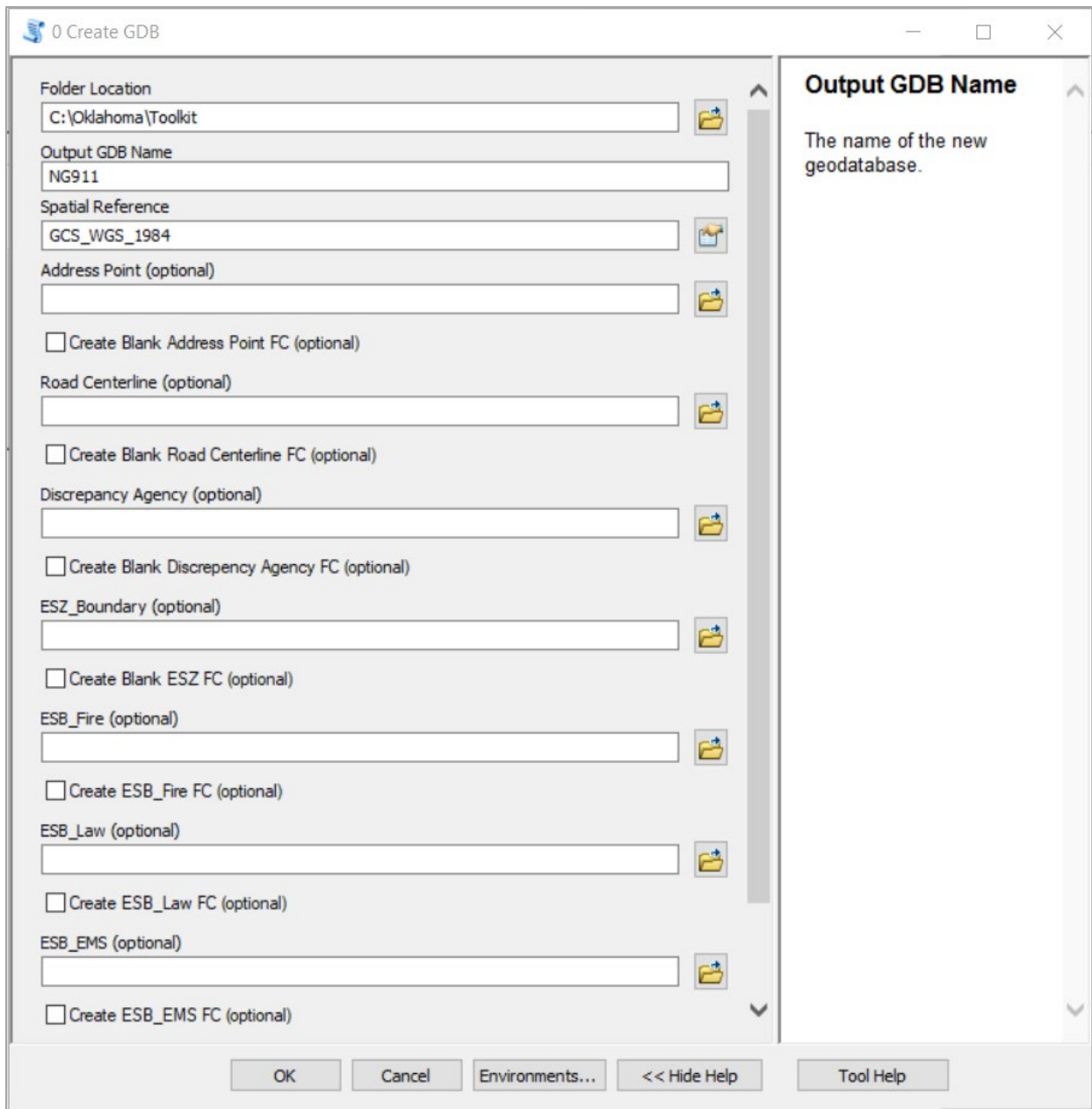
Emergency Service Boundary (ESB) Law

Emergency Service Boundary (ESB) EMS

PSAP Boundary

The Create GDB tool enables users to create a blank feature class for each layer if one has not yet been created by the local agency or state. Users must check the box below each feature class to prompt the tool to create a blank feature class. The tool will create a blank feature class in the new geodatabase with Standard-compliant schema.

Importing feature classes into the geodatabase and creating blank feature classes are optional operations. If feature classes are not selected for import or creation, the Create GDB tool will generate a geodatabase with no feature classes but the tool will set the coordinate system, feature datasets, and domains following the Oklahoma NG9-1-1 and Address Standard.



Run Create GDB

After creating the name and identifying the location of the new geodatabase and selecting the feature classes to be imported or created, click the **OK** button at the bottom of the tool panel to run the Create GDB tool.

The tool may require several minutes to complete the process of generating a new geodatabase.

The Create GDB Tool dialog box, shown to the right, notifies the user when the tool has finished running and displays the status of each the step performed by the tool.

Progress and status of the Create GDB tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then Create GDB. From Messages, scroll down to verify the tool ran successfully.

Confirm Geodatabase Creation

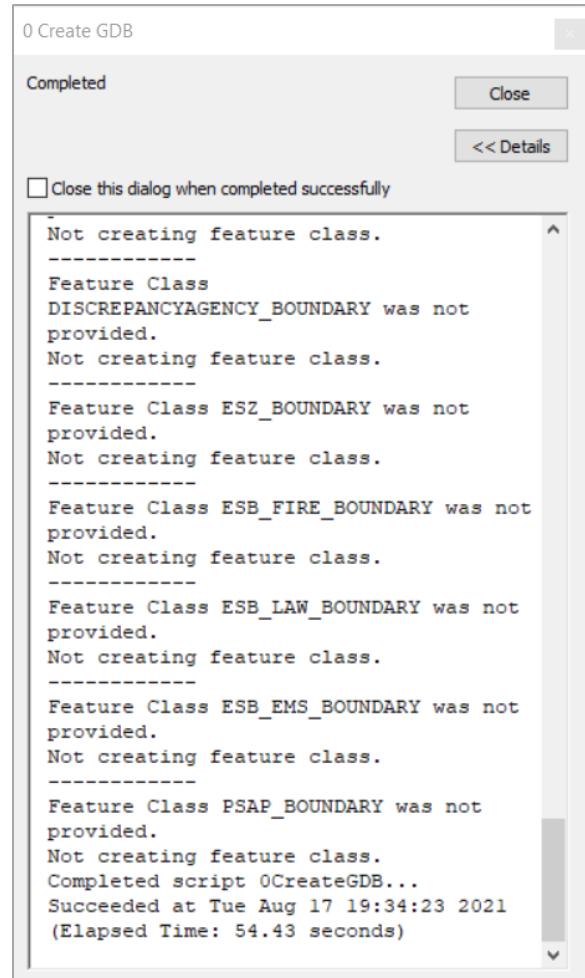
Once the Create GDB tool has finished running, we recommend using ArcCatalog to confirm the geodatabase was created as submitted and populated with the feature class datasets marked for import.

The NG911 feature datasets, domains, and the coordinate system have all been established in the geodatabase following the state's data, schema, and coordinate system standards. This view displays any imported and blank feature classes defined in the creation steps.

The figure below shows an empty geodatabase created using the Create GDB tool. The empty geodatabase is ready to be populated with Standard-compliant data layers/feature classes and for field mapping to be performed.



Following the creation of an empty geodatabase, Okprep Field Mapping Tools are used to map existing datasets into the new geodatabase. If new feature classes are being created without existing data or from incomplete data, the Add Blank FCs tool is used to create blank feature classes in the new geodatabase for manual data population.



Okprep Field Mapping Tools

After using the Create GDB tool to generate a new geodatabase that complies with the Oklahoma NG9-1-1 and Address Standard, feature classes can be field mapped following the state's data standards and NG9-1-1 requirements. Okprep field mapping tools are used to map fields within their schemas into the new Standard-compliant data model. The Okprep toolset includes a field mapping tool for each of the feature classes required by the Standard. Each field mapping tool employs the same workflow and steps to populate its respective feature class with data that meets the requirements of the Standard.

The Oklahoma NG9-1-1 GIS Toolkit is focused on NG9-1-1 data. Feature classes which are created and mapped using the toolkit only include fields and schemas required by the Oklahoma NG9-1-1 and Addressing Standard. No additional fields from local agencies' native GIS schemas will be included in the geodatabase or will be appended using the toolkit. Local GIS authorities should assess operational requirements for GIS data and take appropriate action to maintain their GIS data in compliance with the Oklahoma NG9-1-1 and Addressing Standard.

The Okprep toolset includes tools to field map the NG9-1-1 feature classes:

Address Point

Road Centerline

Discrepancy Agency

ESZ Boundary

ESB Fire

ESB Law

ESB EMS

PSAP Boundary

Feature classes and layers imported during the creation of the geodatabase using the Create GDB tool or new feature classes created within the geodatabase do not require field mapping.

Field names in the native schema which match the field names in the Standard-compliant schema will be automatically populated in the drop-down parameter boxes by the field mapping tool. Providing values for each field is optional; if no values are provided, fields will be created and populated with NULL values.

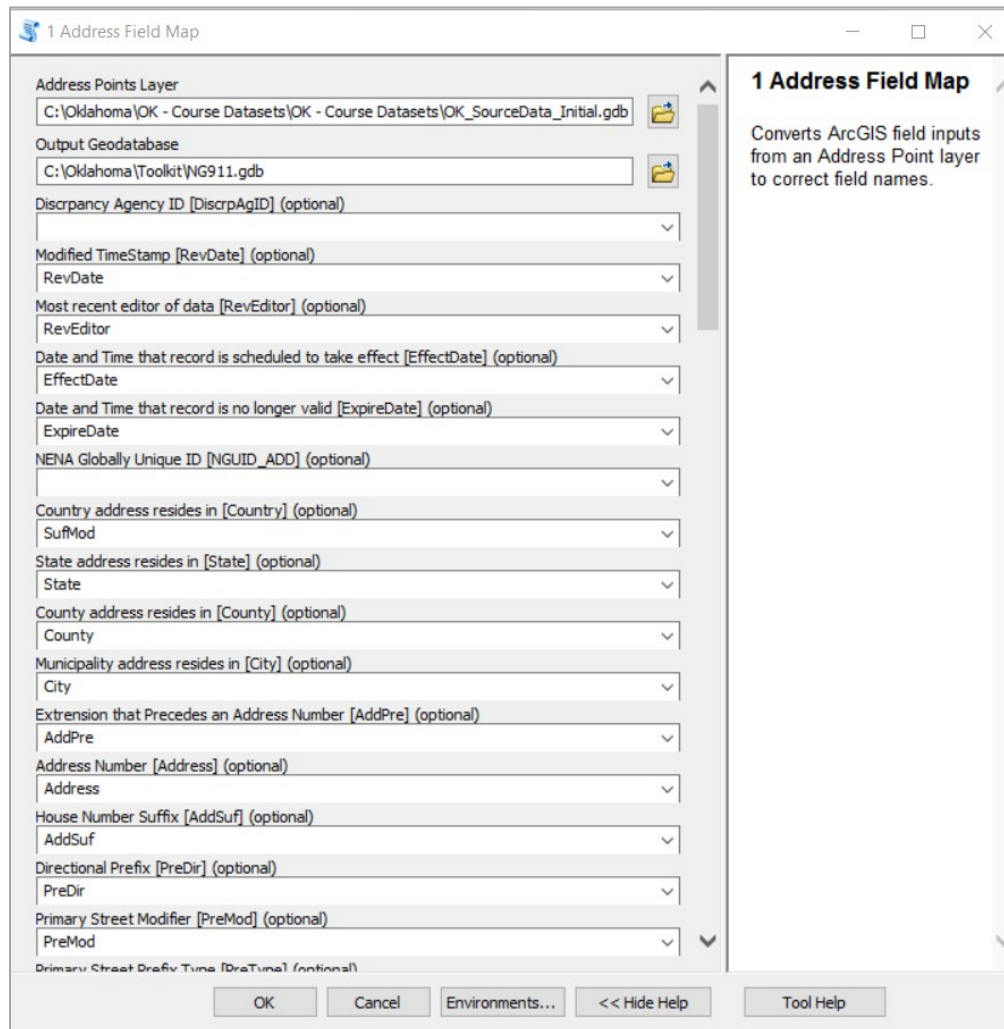
The process for opening and using the field mapping tools are the same for each tool. Step-by-step instructions for using the tools are accompanied by a screenshot of the Address Field Map tool to illustrate the functions and features of the field mapping tools.

Open and Configure Field Mapping

- Open the field mapping tool corresponding to the feature class to be mapped
- Click the folder icon next to the Layer name and select the location of the feature class or shapefile being mapped into the Standard-compliant schema
- Click the folder icon next to Output Geodatabase and select the new geodatabase created using the Create GDB tool, as described in the previous section

Select the Fields and Values to be Mapped

- Use the drop-down boxes to select the appropriate fields from the native schema to map to their respective Standard-compliant fields in the geodatabase
- Repeat for each field to be mapped to a Standard-compliant field in the geodatabase



Run Field Mapping

Click the **OK** button to run the field mapping tool.

As the feature classes are field mapped, they will be stored in the NG9-1-1 feature dataset within the geodatabase.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully. Progress and status of the Field Mapping tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the field mapping tool. From Messages, scroll down to verify the tool ran successfully.

Okprep Field Map Tool Descriptions

Address Field Map Tool

This tool creates a new feature class with the correct field names field-mapped using the Address Points Feature Class fields defined by the User in the toolbox.

Road Field Map Tool

This tool creates a new feature class with the correct field names field-mapped using the Road Centerline Feature Class fields defined by the User in the toolbox.

Discrepancy Agency Field Map Tool

This tool creates a new feature class with the correct field names field-mapped using the Discrepancy Agency Boundary Feature Class fields defined by the User in the toolbox.

Note: The "discrepancy agency boundaries" have also been known in the past as "provisioning boundaries" and "authoritative boundaries."

PSAP Field Map Tool

This tool creates a new feature class with the correct field names field-mapped using the PSAP Feature Class fields defined by the User in the toolbox.

ESB Law, Fire, and EMS Field Map Tools

Each of these tools creates a new feature class with the correct field names field-mapped using the ESB Law, ESB Fire, and ESB EMS Feature Class fields, respectively, defined by the User in the toolbox.

ESZ Field Map Tool

This tool creates a new feature class with the correct field names field-mapped using the ESZ Feature Class fields defined by the User in the toolbox.

Dissolve ESZ Tool

The Dissolve ESZ tool is used to break down an Emergency Service Zone (ESZ) feature class into separate Law, Fire, and EMS Emergency Service Boundary (ESB) polygon layers based on their individual service types.

ESZ Feature Class and Service Type Requirements

Use the Tool on the Original ESZ Feature Class

The Dissolve ESZ tool must be run on the original ESZ data layer/feature class before it has been processed using Okprep Field Mapping tools as the tool will not carry service type values into individual fields. The Dissolve ESZ tool requires service types (Law, Fire, EMS) to be defined within the original ESZ layer.

Service Type Data Requirements

Service types may need to be manually populated within the ESZ field of the original Standard-compliant ESZ_BOUNDARY feature class prior to running the tool. The Dissolve ESZ tool may not carry service type values into the Agency field of the new layers. After the Dissolve ESZ tool has been run, each ESB layer should be examined for topology issues. Individual ESBs should be field mapped after the ESZ layer has been dissolved.

Open and Configure Dissolve ESZ

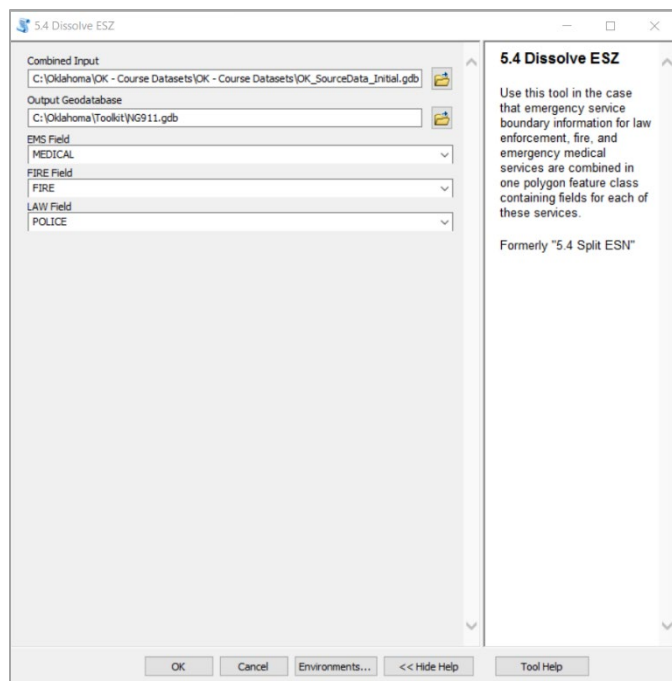
- Open Dissolve ESZ
- Click the folder icon next to **Combined Input** and select the ESZ feature class that contains the required Emergency Service Boundaries
- Click the folder icon next to **Output Geodatabase** and select the NG911 geodatabase
- Click the dropdown menu selection for each service type field and select the appropriate service type

If One or More ESBs Exist in the ESZ

Use the ESB field mapping tools for each service type; if ESBs are missing, create the missing feature class using Create GDB or Add Blank FCs.

If Service Types Are Included in One Field

If ESZ service types are defined in a single field, export individual feature classes as individual ESB layers then perform ESB field mapping.



If Service Type is Unknown

If the service type in the original ESZ data is unknown, GIS staff should work with the PSAP and/or local GIS authority to populate it from attribute tables or geometry.

If There is No ESZ Feature Class or Dataset

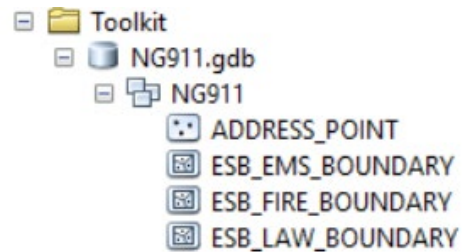
If the agency has no ESZ feature class data, GIS staff should work with the PSAP and/or local GIS authority to define and create it before moving forward.

Run Dissolve ESZ

Click the **OK** button to run the Dissolve ESZ tool.

The ESZ Dissolve tool will generate three new feature classes for NG9-1-1 compliant Law, Fire, and EMS ESB layers within the NG9-1-1 geodatabase, as shown in the figure to the right.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.



Progress and status of the Dissolve ESZ tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Dissolve ESZ tool. From Messages, scroll down to verify the tool ran successfully.

Add Blank FCs Tool

The Add Blank FCs tool is used to create new feature classes within the NG9-1-1 geodatabase.

Open and Configure Add Blank FCs

- Open Add Blank FCs
- Click the folder icon next to **Input GDB** and select the NG9-1-1 geodatabase
- Check each of the feature classes to be created in the NG9-1-1 geodatabase

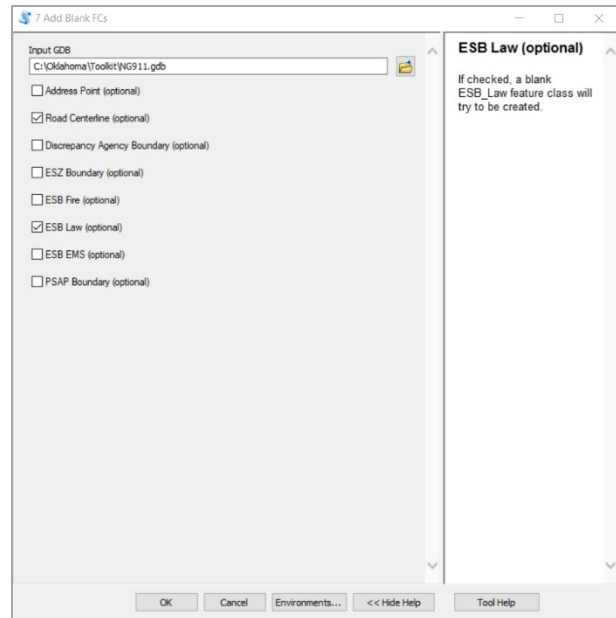
Run Add Blank FCs

Click the **OK** button to run the tool.

Feature classes which have been selected will be created in the NG9-1-1 geodatabase. The Add Blank FCs tool will not create feature classes if they are already present in the NG9-1-1 geodatabase with a duplicate name.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Add Blank FCs tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Add Blank FCs tool. From Messages, scroll down to verify the tool ran successfully.



Adjustment Toolset

Overview

The Adjustment toolset is used to prepare data to pass the battery of data validation checks required for submission into the State of Oklahoma NG9-1-1/GIS Repository. Adjustment tools are used to fix minor errors and inconsistencies in certain fields within a given feature class.

The Adjustment Toolset includes the following tools:

Fix Domain Case

Fix MSAGComm Spaces

Fix Street Type and Direction

Fix Submit

Fix TopoExcept

Step-by-step instructions for using each of these tools begin on the following page.

Fix Domain Case Tool

The Fix Domain Case tool runs on the NG9-1-1 geodatabase and transforms field values in all required feature classes with domains assigned to **UPPER** or **lower** as specified in the domain file. In the event of a mismatch, the field value is updated to the value in the domain file.

Errors such as "Value **us** not in approved domain for field **COUNTRY**" in *FieldValuesCheckResults*, where the error is only due to the casing, should be corrected by running this tool.

Open and Configure Fix Domain Case

- Open Fix Domain Case
- Click the folder icon next to **NG911 Geodatabase**
- Navigate to the folder location of the NG9-1-1 geodatabase, select it, and click **Add**

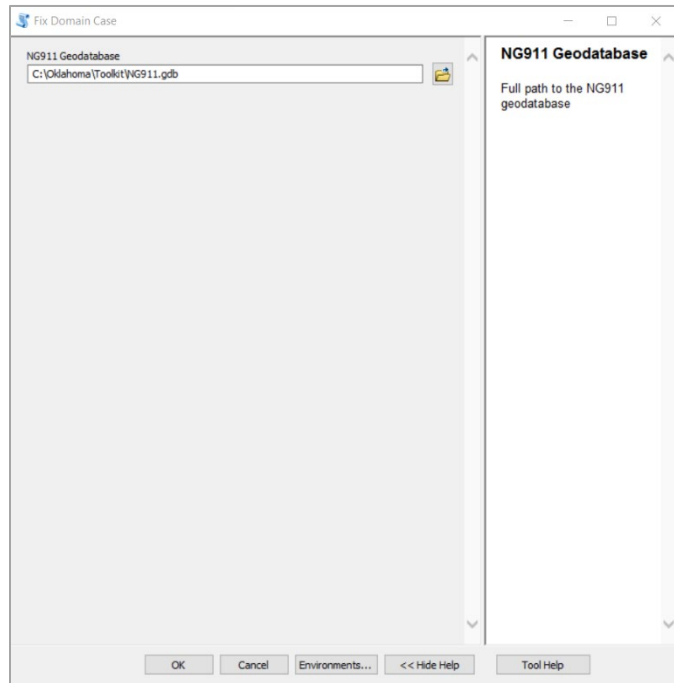
Run Fix Domain Case

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Fix Domain Case tool can also be monitored in ArcCatalog. From Geoprocessing >

Results, expand Current Session then select the Fix Domain Case tool. From Messages, scroll down to verify the tool ran successfully.



Fix MSAGComm Spaces Tool

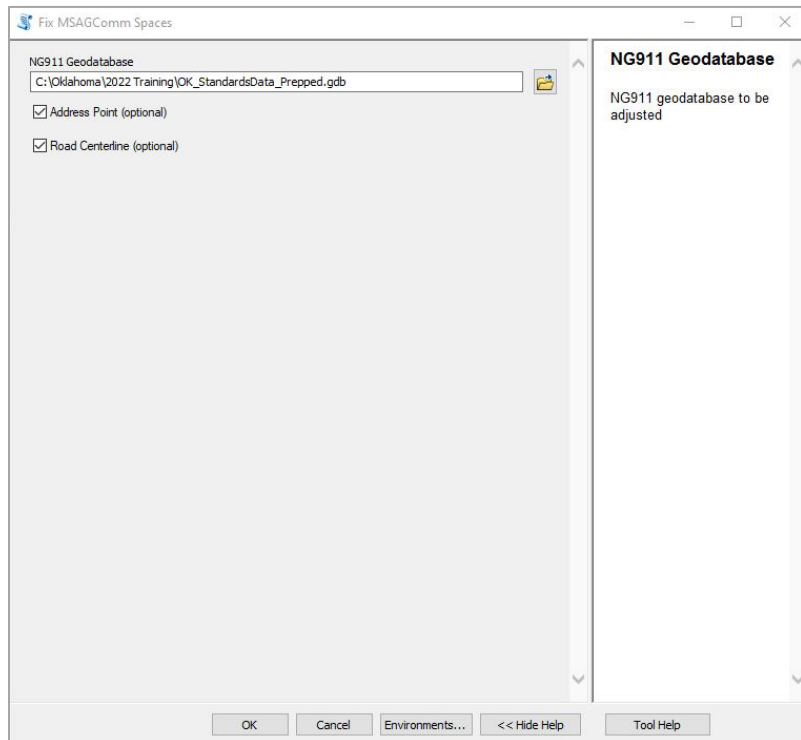
The Fix MSAGComm Spaces tool is used to clean up MSAGComm fields by removing leading and trailing spaces from *MSAGComm*, *MSAGComm_L*, and *MSAGComm_R*. This tool should be run before running any of the toolkit's MSAG tools. This tool can be run against the Road Centerlines feature class, the Address Point feature class, or both.

Open and Configure

Fix MSAGComm Spaces

- Open Fix MSAGComm Spaces
- Click the folder icon next to **NG911 Geodatabase**
- Navigate to the folder location of the NG9-1-1 geodatabase, select it, and click **Add**
- Check the feature classes the tool will be run on:
 - Address Point
 - Road Centerline

Note: leaving both feature classes unchecked, or selecting both, will result in the tool running on both.



Run Fix MSAGComm Spaces

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Fix MSAGComm Spaces tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Fix MSAGComm Spaces tool. From Messages, scroll down to verify the tool ran successfully.

Fix Street Type and Direction Tool

The Fix Street Type and Direction tool converts legacy abbreviated values in the street type and direction fields to full Standard-compliant values. For example, the tool may be used to convert values such as *AVE* to *AVENUE*.

The Fix Street Type and Direction tool may also be used to copy legacy abbreviated values in *PreDir*, *Street*, *StreetType*, and *SufDir* fields into new legacy fields created within the schema such as *LgcyPreDir*, *LgcyStreet*, *LgcyType*, and *LgcySufDir*.

This tool is intended to be run on the **Road Centerline** and **Address Point** feature classes as both of these layers contain Street Type and Direction fields which require fully spelled out values. The Fix Street Type tool may be run on the **Address Point** feature class to generate a legacy address field (*LgcyAdd*) from the *Address* field and the four legacy fields described above.

Open and Configure

Fix Street Type and Direction

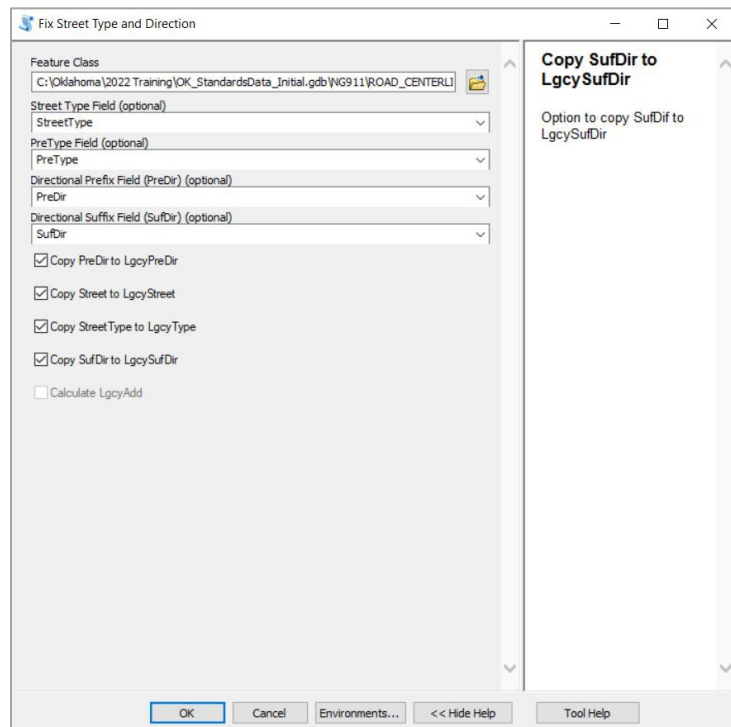
- Open Fix Street Type and Direction

Select the Feature Class

- Click the folder icon next to **Feature Class**
- Navigate to the Road Centerline or Address Point feature class and click **Add**

Select the Appropriate Values for Each Field

- Select the appropriate values from the dropdown list for each of the following fields:
 - Street Type Field
 - PreType Field
 - Directional Prefix Field (PreDir)
 - Directional Suffix Field (SufDir)



This step is not required but enables the PSAP, County, COG, or GIS authority to specify the Standard-compliant field values.

Copy Legacy Abbreviated Values into Legacy Fields

If you are creating new fields for legacy values, check the boxes to copy the applicable Street Type and Direction fields to new legacy fields as shown in the figure below. If the Fix Street Type and Direction tool is being run on an Address Point feature class, check the box to **Calculate LgcyAdd**. These steps are not mandatory but are strongly recommended if the

legacy GIS data being used to create a Standard-compliant NG9-1-1 geodatabase continues to support existing enterprise applications or other business requirements.

Run Fix Street Type and Direction

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Fix Street Type and Direction tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Fix Street Type and Direction tool. From Messages, scroll down to verify the tool ran successfully.

Fix Submit Tool

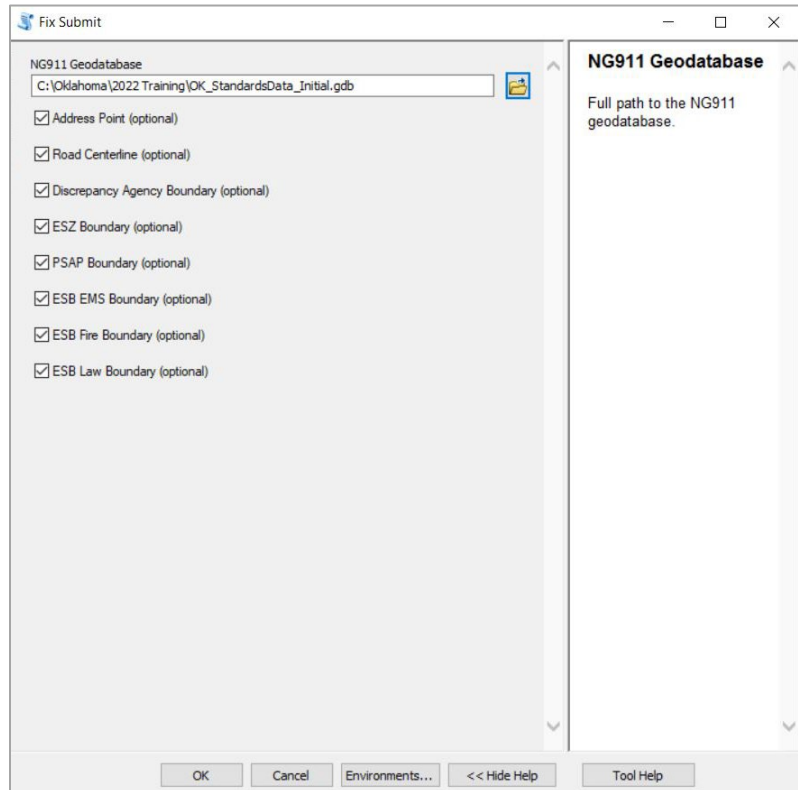
The Fix Submit tool is run on the NG9-1-1 geodatabase to populate the Submit field in each feature class with the value **Y**, which will flag the feature to be submitted for validation.

Any features which should not be submitted for validation should be manually populated with the value **N** by the managing GIS authority.

Users can run the Fix Submit tool on the entire geodatabase, or select the feature class(es) against which tool is to be run.

Open and Configure Fix Submit

- Open Fix Submit
- Click the folder icon next to **NG911 Geodatabase**
- Navigate to the NG9-1-1 geodatabase and click **Add**
- Check the feature class(es) the tool will be run on:
 - Address Point
 - Road Centerline
 - Discrepancy Agency Boundary
 - ESZ Boundary
 - PSAP Boundary
 - ESB EMS Boundary
 - ESB Fire Boundary
 - ESB Law Boundary



Note: leaving all feature classes unchecked, or not selecting any, will result in the tool running on both.

Run Fix Submit

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Fix Submit tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Fix Submit tool. From Messages, scroll down to verify the tool ran successfully.

Fix TopoExcept Tool

Following the NG9-1-1 GIS data workflow, preparing Road Centerline data for the NG9-1-1 geodatabase often requires topology checks to be run on the feature class. After topology checks have been performed on the Road Centerline data and exceptions have been marked, values in the `TopoExcept` must match those in the Standard-compliant TOPOEXCEPT domain.

The Fix TopoExcept tool is run on the Road Centerline feature class after topology checks have been completed and exceptions have been marked to convert the values in the `TopoExcept` field to match Standard-compliant values in the TOPOEXCEPT domain.

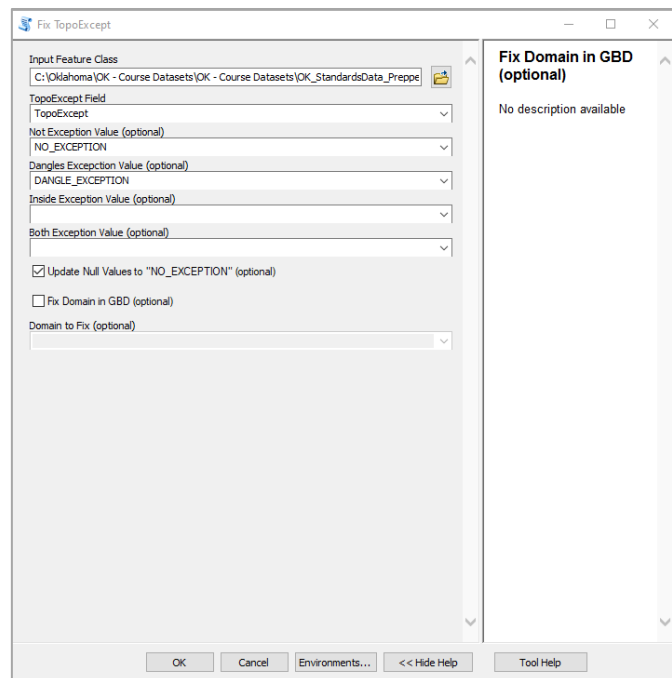
The Fix TopoExcept tool enables the GIS authority to change NULL values in the TopoExcept field to `NO_EXCEPTION`. Additionally, this tool provides GIS authorities with **Fix Domain in GDB** which is used to update the domain value in TopoExcept to the Standard-compliant domain.

Open Fix TopoExcept and Select the Input Feature Class

- Open the Fix TopoExcept tool
- Click the folder icon next to **Input Feature Class**
- Navigate to the Road Centerline feature class to run through the tool and click **Add**

Select and Define the Appropriate Field Values

- Under TopoExcept Field, select TopoExcept
- If applicable, enter exception values for the following:
 - Not Exception Value (example: `NO_EXCEPTION`)
 - Dangles Exception Value (example: `DANGLE_EXCEPTION`)
 - Inside Exception Value
 - Both Exception Value



Update Null Values in TopoExcept to `NO_EXCEPTION`

To populate `NULL` values in the TopoExcept field with `NO_EXCEPTION`, check the box next to **Update Null Values to “NO_EXCEPTION” (optional)**. This step, while optional, is highly recommended as TopoExcept is a Mandatory field in the Oklahoma NG9-1-1 and Address Standard and every record within TopoExcept must be populated.

Fix Domain in GDB (Optional)

Check the box to **Fix Domain in GDB (optional)** to convert values in TopoExcept to match the Standard-compliant values within the TOPOEXCEPT domain.

Run Fix TopoExcept

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Fix TopoExcept tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Fix TopoExcept tool. From Messages, scroll down to verify the tool ran successfully.

Comparison Toolset

Overview

The Comparison Toolset is used to identify differences between versions of standards compliant NG9-1-1 data feature classes or to compare entire geodatabases. These tools are valuable to assess change detection.

The Comparison Toolset includes the following tools:

Compare NG911 Data

Compare NG911 Geodatabases

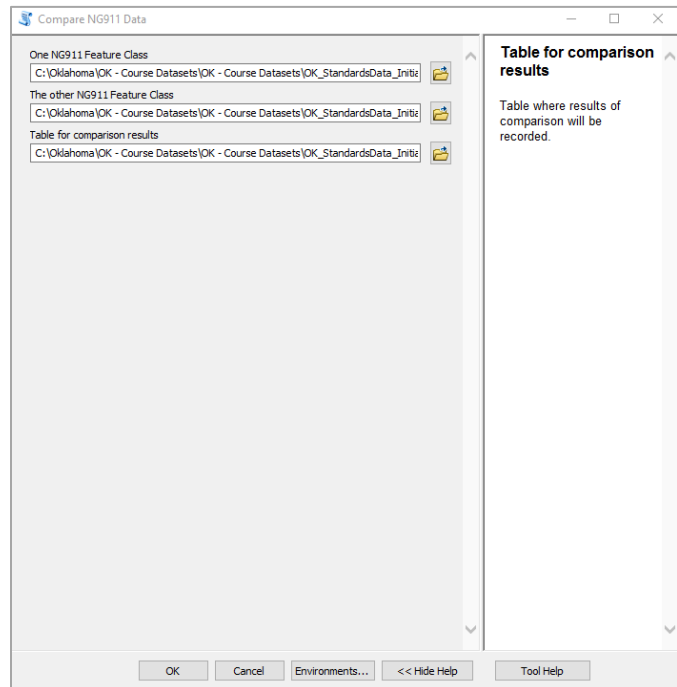
Instructions for each tool begin on the following page.

Compare NG911 Data Tool

Compare NG911 Data compares two Standard-compliant feature classes of the same type, stored in two separate geodatabases, and reports any differences in their attributes, geometry, updated records, or deleted records. The results from this tool are reported in a table that can be stored in either geodatabase which contains the feature class being compared.

Open and Configure Compare NG911 Data

- Open Compare NG911 Data
- Click the folder icon next to **One NG911 Feature Class**
 - Navigate to the first feature class being compared
 - Select it, and click **Add**
- Click the folder icon next to **The other NG911 Feature Class**
 - Navigate to the second feature class being compared
 - Select it, and click **Add**
- Click the folder icon next to **Table for comparison results**
 - Navigate to the geodatabase storing the table results
 - Double click the geodatabase
 - Enter a name for the table, and click **Save**



Run Compare NG911 Data

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Compare NG911 Data tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Compare NG911 Data tool. From Messages, scroll down to verify the tool ran successfully.

Viewing the Results of the Compare NG911 Data Tool

Results can be viewed in ArcCatalog or ArcMap. To view in ArcCatalog, click on the results table and click on the preview tab. The figure below shows an example of the Compare NG911 Data tool results, output as a table stored in one of the compared geodatabases.

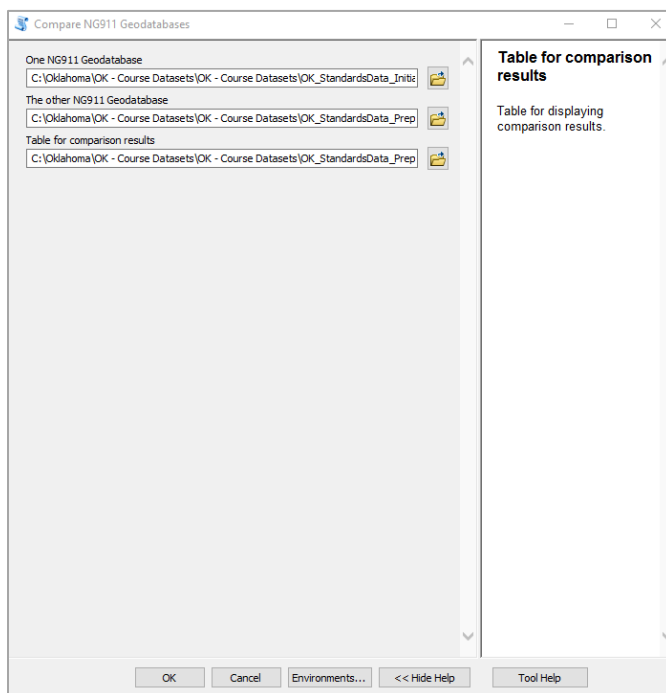
Compare NG911 Geodatabases Tool

Compare NG911 Geodatabases compares two Standard-compliant geodatabases and reports any differences in their attributes, geometry, new records, or deleted records. The results from this tool are reported in a table that can be stored in either geodatabase being compared.

Open and Configure

Compare NG911 Geodatabases

- Open Compare NG911 Geodatabases
- Click the folder icon next to **One NG911 Geodatabase**
 - Navigate to the first geodatabase being compared
 - Select it, and click **Add**
- Click the folder icon next to **The other NG911 Geodatabase**
 - Navigate to the first geodatabase being compared
 - Select it, and click **Add**
- Click the folder icon next to **Table for comparison results**
 - Navigate to the geodatabase storing the table results
 - Double click the geodatabase
 - Enter a name for the table, and click **Save**



Run Compare NG911 Geodatabases

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Compare NG911 Geodatabase tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Compare NG911 Geodatabase tool. From Messages, scroll down to verify the tool ran successfully.

Viewing the Results of the Compare NG911 Geodatabases Tool

Results can be viewed in ArcCatalog or ArcMap. To view in ArcCatalog, click on the results table and click on the preview tab. The figure below shows an example of the Compare NG911 Geodatabases tool results, output as a table stored in one of the compared geodatabases.

Enhancement Toolset

Overview

Enhancement tools are used to automate data creation tasks and perform data quality checks.

The Enhancement Toolset includes the following tools:

Add/Validate NG911 Topology

Assign Unique NENA

Calculate FullName and FullAddr

Calculate Parity

Check Road ESN Values

Check Road FromLevel ToLevel

Find Address Range Overlaps

Generate Fishbone Analysis

Geocompare Address Points

Populate RCLMATCH: NO_MATCH

Instructions for each tool begin on the following page.

Add/Validate NG911 Topology Tool

Add/Validate NG911 Topology runs on the NG9-1-1 geodatabase to validate feature classes according to the topology rules within and against feature classes. Topology only examines the relationships of the features and/or layers' geometries, not their attribute values.

NG9-1-1 GIS Topology Rules and Relationships

A complete list of the NG9-1-1 topology rules and relationships is available in the GIS Data Processes and Workflows section of this manual, and is also available in the NG9-1-1 GIS Toolkit document library.

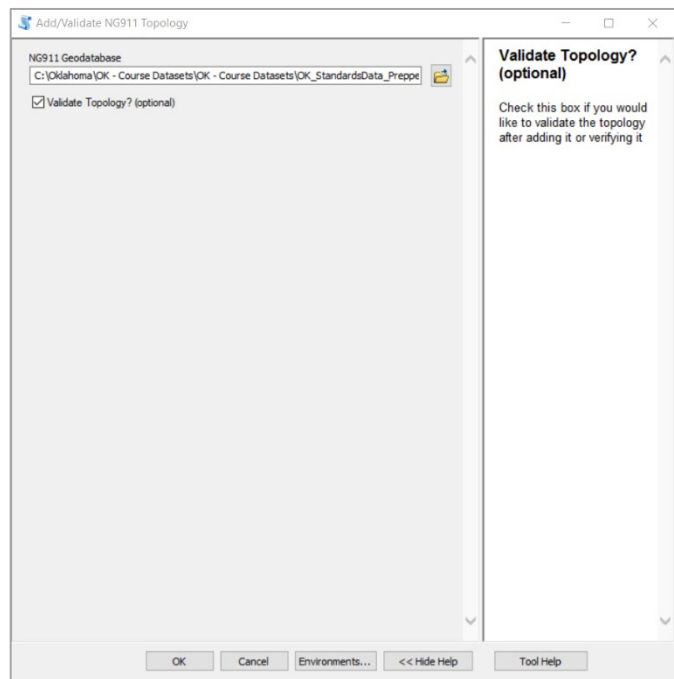
Open and Configure

Add/Validate NG911 Topology

- Open Add/Validate NG911 Topology
- Click the folder icon next to **NG911 Geodatabase**
- Navigate to the 911 geodatabase location
- If you are validating topology within the NG911 geodatabase, check the box next to **Validate Topology? (optional)**


Run Add/Validate NG911 Topology

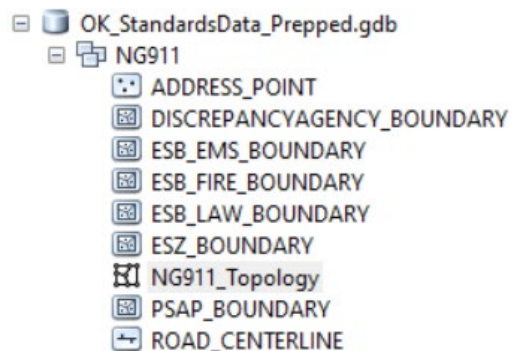
Click the **OK** button to run the tool. It may take a few minutes for the tool to finish running.

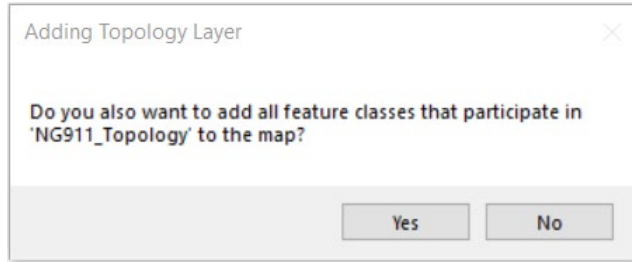


Expand the New NG9-1-1 Topology and View Results

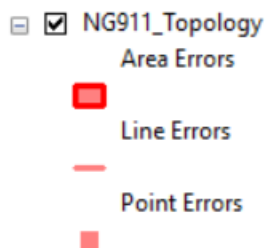
Once the tool has been run, expand the NG9-1-1 feature dataset within the geodatabase. A new topology called **NG911_Topology** has been created.

To view the topology results, open ArcMap and click the Add Data  button. Navigate to **NG911_Topology** and double click or select it, then click **Add** to add it to the map. A dialogue box will appear asking if you want to add the associated feature classes that participate in the topology to the map.





Click **Yes** to add the other feature classes which participate in the topology to the map or click **No** to add just the topology to the map. Clicking **Yes** is strongly recommended as it will add the other feature classes for additional context when examining the topology.



Anomalies and errors in the data's topology are symbolized with red and pink in ArcMap, as shown in the figure to the left. The anomalies or errors identified in the data include relationships that violate the Oklahoma NG9-1-1 and Address Standard's topology rules for NG9-1-1 GIS data. Data editors should be familiar with these rules and make necessary adjustments to the GIS data to resolve the anomalies. Topology errors will prevent submission to the repository.

Exceptions to Topology Rules

As described in the section **Exceptions to Oklahoma NG9-1-1 and Address Standard Topology Rules**, ROAD_CENTERLINE is the only feature class in which exceptions to the topology rules are allowed. [TopoExcept](#) is a Mandatory field within the Standard and every record in the ROAD_CENTERLINE feature class requires a value in this field.

ROAD_CENTERLINE exceptions are marked in the Mandatory field [TopoExcept](#) with one the following values:

- Feature is an Exception to *Must Not Have Dangles*
- Feature is an Exception to *Must be Inside Discrepancy Agency Boundary*
- Feature is an Exception to Both Topology Rules
- Feature is Not an Exception to the Topology Rules

Assign Unique NENA ID Tool

This tool assigns a NENA Globally Unique ID (NGUID) for a selected feature class by either:

- a. Automatically generating a Unique ID to create the NGUID
- b. Using a locally assigned Unique ID to create the NGUID

The NGUID field is mandatory per the Oklahoma NG9-1-1 and Address Standard for all feature classes required by the state NG9-1-1 data model. The Assign Unique NENA ID tool concatenates the *Layer Name*, *Agency_ID*, and *Unique_ID* (auto generated or locally assigned) to generate the NGUID.

Assign Unique NENA ID can be run on data with a locally assigned unique ID, or the tool will automatically generate the unique ID if one does not already exist in the data. If a locally assigned unique ID is desired, the tool should be run on the native schema as a locally assigned unique ID is not currently built into the NG9-1-1 data model.

Maintaining the NGUID at the enterprise level allows the NGUID to be field mapped to the standards compliant feature class during the field mapping process instead of generating one every time the data is prepared. In addition, the NGUID of the NG9-1-1 dataset is always linked to the feature class at the enterprise level.

Notes for GIS Editors

- GIS editors should strongly consider maintaining the NGUID at the enterprise level to facilitate ongoing data maintenance and preparation of the NG9-1-1 dataset
- GIS editors should be mindful of the NGUID value being duplicated during splits or when data is copied/pasted; duplicate NGUID values will flag as errors in the data, preventing successful validation and submission to the state NG9-1-1 data repository

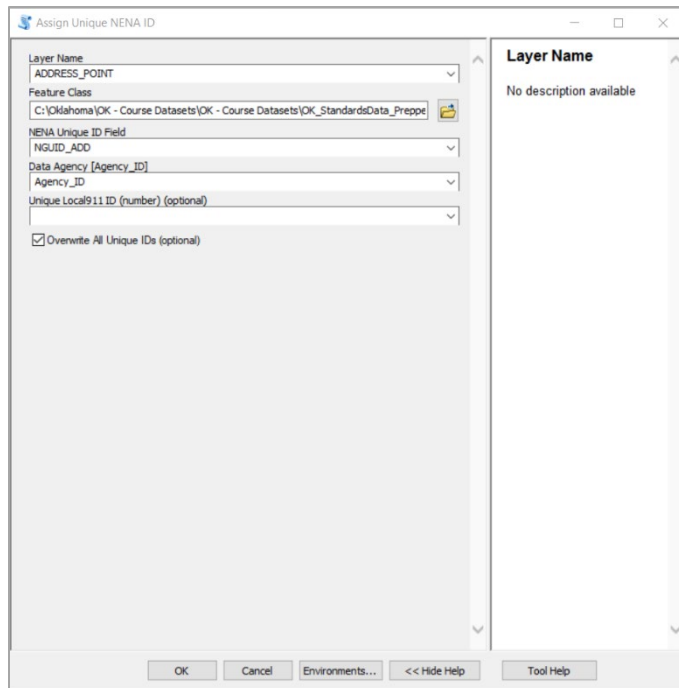
As described above, if a locally assigned unique ID is not provided, the NGUID will be automatically generated and populated by the Assign Unique NENA ID tool. If a locally assigned unique ID is being used to create the NGUID, the following fields must be added to and populated within the native schema before running the tool:

- NGUID_ (layer)
- Agency_ID
- A local unique ID (string type representing a number)

Please refer to the Oklahoma NG9-1-1 and Address Standard for specifics regarding field naming conventions for each feature class, field type, and length.

Open and Configure Assign Unique NENA ID

- Open Assign Unique NENA ID
- Select the Layer Name for the feature class to be assigned NGUIDs from the options provided in the drop-down list
- Click the folder icon next to **Feature Class**, navigate to the feature class, and click **Add**
- Select the NGUID layer name from the drop-down list selections for NENA Unique ID
- Select the Agency_ID from the drop-down list selections for Data Agency
- Select the Unique Local911 ID from the drop-down list selections (optional)
- To overwrite existing IDs in the NGUID layer, check the box to Overwrite All Unique IDs
Note: if unchecked, features with non-NULL values will not be modified



Run Assign Unique NENA ID

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Assign Unique NENA ID tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Assign Unique NENA ID tool. From Messages, scroll down to verify the tool ran successfully.

Calculate FullName and FullAddr

Calculate FullName and FullAddr calculates the `FullName` field in the ADDRESS_POINT or the ROAD_CENTERLINE feature class, or the `FullAddr` field for the ADDRESS_POINT feature class.

The **Calculate FullAddr** function of this tool gathers the fields required to create the `FullAddr` field and concatenates attributes for each feature (ignoring nulls). The resulting string is written to the feature's `FullAddr` field. If any feature's concatenated string is too long for the `FullAddr` field, that feature's FullAddr attribute will be set to null. **FullAddr** fields used for calculation: `AddPre`, `Address`, `AddSuf`, `PreDir`, `PreMod`, `PreType`, `PreTypeSep`, `Street`, `StreetType`, `SufDir`, `SufMod`, `BldgName`, `BldgUnit`

The **Calculate FullName** function of this tool gathers the fields required to create the `FullName` field and concatenates attributes for each feature (ignoring nulls). The resultant string is written to the feature's `FullName` field. If any feature's concatenated string is too long for the `FullName` field, that feature's FullName attribute will be set to null. **FullName** fields used for calculation: `PreDir`, `PreMod`, `PreType`, `PreTypeSep`, `Street`, `StreetType`, `SufDir`, and `SufMod`

Open and Configure

Calculate FullName and FullAddr

- Open Calculate FullName and FullAddr
- Select the input feature class
 - If the ADDRESS_POINT feature class is selected, users may select `FullName`, `FullAddr`, or both to be calculated
 - If the ROAD_CENTERLINE feature class is selected, only `FullName` can be calculated

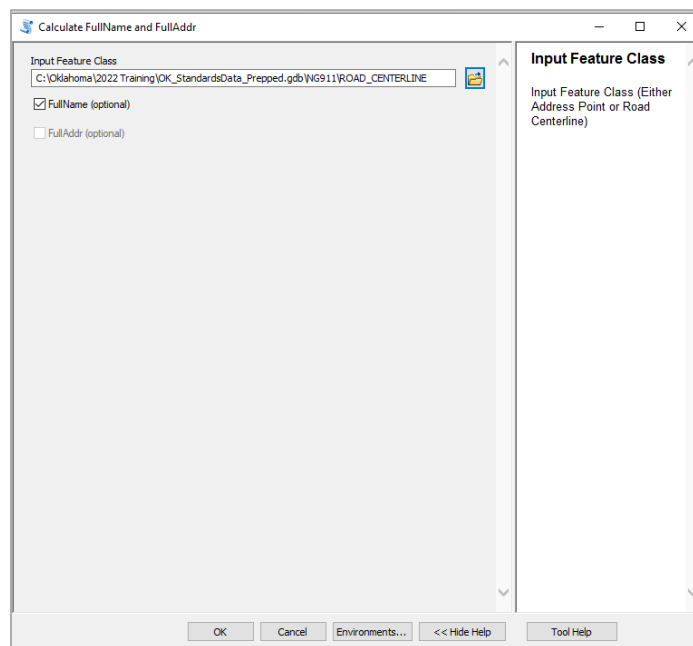
Run Calculate FullName and FullAddr

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Calculate FullName and FullAddr tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Calculate FullName and FullAddr tool. From Messages, scroll down to verify the tool ran successfully.

Note: this tool will need to be re-run on each feature class if any of the fields are changed.



Calculate Parity Tool

Calculate Parity calculates the Mandatory `Parity_L` and `Parity_R` fields in the `ROAD_CENTERLINE` feature class based on the last digit in the address range fields:

`Add_L_From`, `Add_L_To`, `Add_R_From`, `Add_R_To`

Open and Configure Calculate Parity

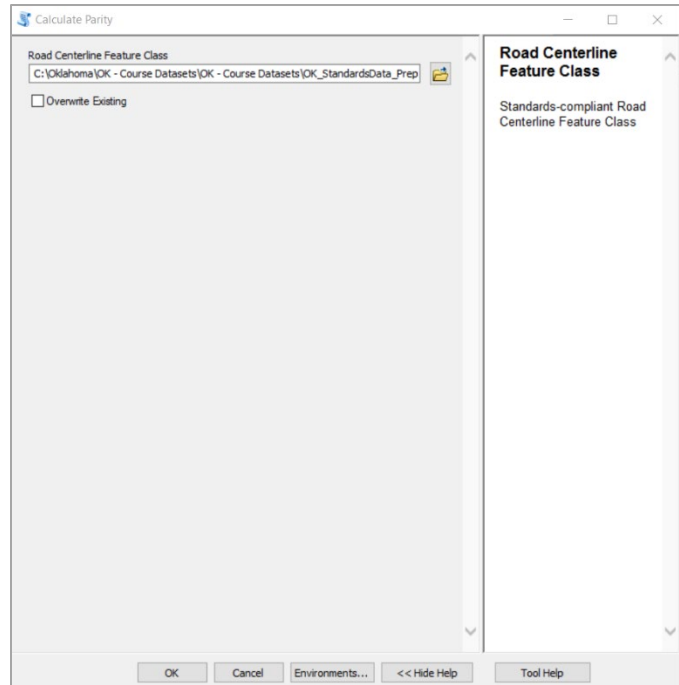
- Open Calculate Parity
- Click the folder icon next to **Road Centerline Feature Class**, navigate to the `ROAD_CENTERLINE` feature class, and click **Add**
- Check the box for **Overwrite Existing** to overwrite all values in the field
Note: If this box is left unchecked, only `NULL` values in the field will be calculated and updated

Run Calculate Parity

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Calculate Parity tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Calculate Parity tool. From Messages, scroll down to verify the tool ran successfully.



Check Road ESN Values Tool

Check Road ESN Values verifies the conditional `ESN_L` and `ESN_R` fields in the `ROAD_CENTERLINE` feature class against the ESN values of the centerlines' spatial location in `ESZ_BOUNDARY`.

Check Road ESN also provides an option for users with an Advanced license to run a faster, as well as more thorough, analysis of the feature class.

ESZ_BOUNDARY required fields: `NGUID_ESZ`, `ESN`, `SUBMIT`

ROAD_CENTERLINE required fields: `NGUID_RDCL`, `ESN_L`, `ESN_R`, `SUBMIT`

Output results are reported in a table called **FieldValuesCheckResults**.

Note for GIS Editors

- The Check Road ESN Values tool only produces Notices and does not produce Errors; Notices generated by the tool will not prevent submission of the geodatabase into the state NG9-1-1 data repository

Open and Configure

Check Road ESN Values

- Open Check Road ESN Values
- Click the folder icon next to **NG911 Geodatabase**, navigate to the file, and click **Add**
- If the user or authority has the proper Advanced license, check the box next to **Run Advanced User License Analysis** to perform a faster and thorough analysis

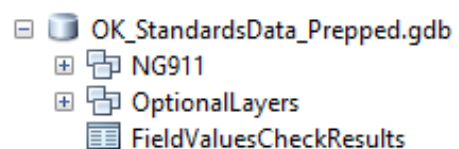
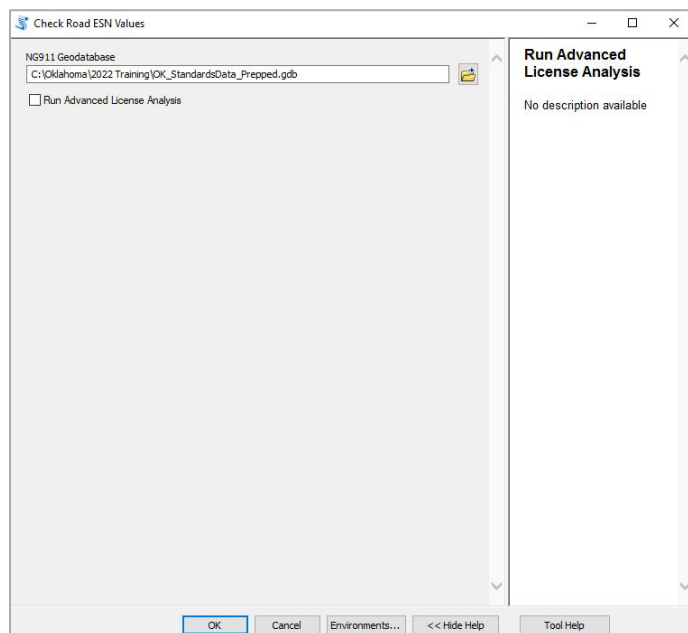
Run Check Road ESN Values

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check Road ESN Values tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check Road ESN Values tool. From Messages, scroll down to verify the tool ran successfully.

If the tool runs successfully, results will be reported in the **FieldValuesCheckResults** table which is exported to the geodatabase, as shown in the figure to the right.



Viewing Results of the Check Road ESN Values Tool

To view the results from this tool, select FieldValuesCheckResults in the Catalog Tree and click the Preview tab. Alternatively, the table can be viewed in ArcMap.

A screenshot of the FieldValuesCheckResults table with results values is shown below.

OBJECTID *	DATEFLAG	DESCRIPTION	LAYER	FIELD	FEATUREID	CHECK
1	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_19@cog.acog.ok.gov	Check Road ESN Values
2	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_27@cog.acog.ok.gov	Check Road ESN Values
3	9/22/2021	Notice: Segment ESN_L value 6202 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_40@cog.acog.ok.gov	Check Road ESN Values
4	9/22/2021	Notice: Segment ESN_L value 6206 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_42@cog.acog.ok.gov	Check Road ESN Values
5	9/22/2021	Notice: Segment ESN_L value 6206 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_43@cog.acog.ok.gov	Check Road ESN Values
6	9/22/2021	Notice: Segment ESN_L value 6206 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_45@cog.acog.ok.gov	Check Road ESN Values
7	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_75@cog.acog.ok.gov	Check Road ESN Values
8	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_84@cog.acog.ok.gov	Check Road ESN Values
9	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_104@cog.acog.ok.gov	Check Road ESN Values
10	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_106@cog.acog.ok.gov	Check Road ESN Values
11	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_118@cog.acog.ok.gov	Check Road ESN Values
12	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_187@cog.acog.ok.gov	Check Road ESN Values
13	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_223@cog.acog.ok.gov	Check Road ESN Values
14	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_229@cog.acog.ok.gov	Check Road ESN Values
15	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_230@cog.acog.ok.gov	Check Road ESN Values
16	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_231@cog.acog.ok.gov	Check Road ESN Values
17	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_233@cog.acog.ok.gov	Check Road ESN Values
18	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_262@cog.acog.ok.gov	Check Road ESN Values
19	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_333@cog.acog.ok.gov	Check Road ESN Values
20	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_334@cog.acog.ok.gov	Check Road ESN Values
21	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_335@cog.acog.ok.gov	Check Road ESN Values
22	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_359@cog.acog.ok.gov	Check Road ESN Values
23	9/22/2021	Notice: Segment ESN_L value None does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_379@cog.acog.ok.gov	Check Road ESN Values
24	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_390@cog.acog.ok.gov	Check Road ESN Values
25	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_429@cog.acog.ok.gov	Check Road ESN Values
26	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_430@cog.acog.ok.gov	Check Road ESN Values
27	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_436@cog.acog.ok.gov	Check Road ESN Values
28	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_438@cog.acog.ok.gov	Check Road ESN Values
29	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_441@cog.acog.ok.gov	Check Road ESN Values
30	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_463@cog.acog.ok.gov	Check Road ESN Values
31	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_483@cog.acog.ok.gov	Check Road ESN Values
32	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_500@cog.acog.ok.gov	Check Road ESN Values
33	9/22/2021	Notice: Segment Esn_Lj Esn_R value 6216 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_502@cog.acog.ok.gov	Check Road ESN Values
34	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_503@cog.acog.ok.gov	Check Road ESN Values
35	9/22/2021	Notice: Segment Esn_Lj Esn_R value 6206 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_526@cog.acog.ok.gov	Check Road ESN Values
36	9/22/2021	Notice: Segment ESN_L value 6216 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_27@cog.acog.ok.gov	Check Road ESN Values
37	9/22/2021	Notice: Segment Esn_Lj Esn_R value 6204 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_29@cog.acog.ok.gov	Check Road ESN Values
38	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_121@cog.acog.ok.gov	Check Road ESN Values
39	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_223@cog.acog.ok.gov	Check Road ESN Values
40	9/22/2021	Notice: Segment Esn_Lj Esn_R value 6204 does not match ESN of physical	ROAD_CENTERLINE	Esn_Lj Esn_R	ROAD_CENTERLINE_273@cog.acog.ok.gov	Check Road ESN Values
41	9/22/2021	Notice: Segment ESN_L value 6204 does not match ESN of physical locatio	ROAD_CENTERLINE		ROAD_CENTERLINE_322@cog.acog.ok.gov	Check Road ESN Values

Clearing the FieldValuesCheckResults Table After Using the Tool

As described in *Viewing Data*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear this table after running the Check Road ESN Values tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If the FieldValuesCheckResults table is not cleared, output results from this and other tool runs will compound in the table.

Check Road FromLevel ToLevel

This tool ensures the `FromLevel` and `ToLevel` field attributes correctly depict overpass level rise and fall along road segments which are both touching and have the same `FullName`.

This tool's functions search the `ROAD_CENTERLINE` feature class, ordered by `FullName` then `Add_L_From`, to create a list of bad segments if the end of the first segment is equal to the beginning of a second segment, and the two segments are not disjointed. If bad segments are identified, they are noted and appended to the `FieldValuesCheckResults` table.

Check Road FromLevel ToLevel required fields:

`NGUID_RDCL`, `Add_L_From`, `FullName`, `FromLevel`, `ToLevel`

Open and Configure

Check Road FromLevel ToLevel

- Open Check Road FromLevel ToLevel
- Click the folder icon next to **NG911 Geodatabase**, navigate to the geodatabase, and click **Add**

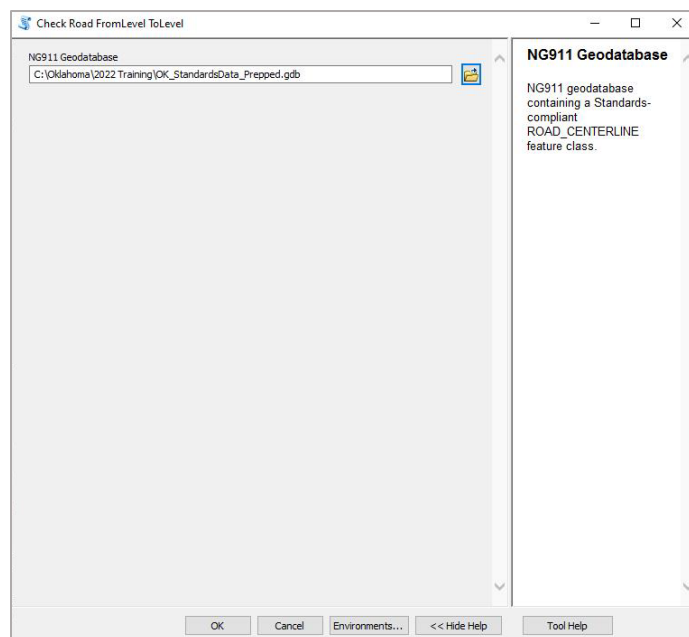
Run Check Road FromLevel ToLevel

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check Road

FromLevel ToLevel tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check Road FromLevel ToLevel tool. From Messages, scroll down to verify the tool ran successfully.



Find Address Range Overlaps Tool

Find Address Range Overlaps identifies overlapping address ranges in the ROAD_CENTERLINE feature class. Output results are reported in a table called FieldValuesCheckResults. Note: this tool only produces Notices, not Errors and its results will not prevent submission.

Open and Configure

Find Address Range Overlaps

- Open Find Address Range Overlaps
- Click the folder icon next to **NG911 Geodatabase**, navigate to the geodatabase, and click **Add**

Run Find Address Range Overlaps

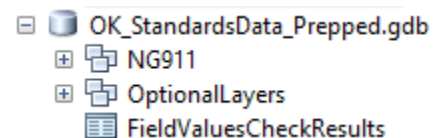
Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Find Address Range Overlaps tool can also be monitored in ArcCatalog. From

Geoprocessing > Results, expand Current Session then select the Find Address Range Overlaps tool. From Messages, scroll down to verify the tool ran successfully.

When the tool has been successfully run, results will be reported in the FieldValuesCheckResults table which is exported to the geodatabase.



View Results from the Find Address Range Overlaps Tool

To view the results, select FieldValuesCheckResults in the Catalog Tree and click the Preview tab. Alternatively, the table can be viewed in ArcMap. Data output to the Find Range Overlaps Tool is shown in the figure below.

OBJECTID	DATEFLA	DESCRIPTION	LAYER	FIELD	FEATUREID	CHECK
68	9/22/2021	Notice: ROAD_CENTERLINE_415@cog.acog.ok.gov has an overlapping address range.	ROAD_CENTERLINE		ROAD_CENTERLINE_415@cog.acog.ok.gov	Overlapping Address Range
69	9/22/2021	Notice: ROAD_CENTERLINE_56@cog.acog.ok.gov has an overlapping address range.	ROAD_CENTERLINE		ROAD_CENTERLINE_56@cog.acog.ok.gov	Overlapping Address Range
70	9/22/2021	Notice: ROAD_CENTERLINE_485@cog.acog.ok.gov has an overlapping address range.	ROAD_CENTERLINE		ROAD_CENTERLINE_485@cog.acog.ok.gov	Overlapping Address Range
71	9/22/2021	Notice: ROAD_CENTERLINE_522@cog.acog.ok.gov has an overlapping address range.	ROAD_CENTERLINE		ROAD_CENTERLINE_522@cog.acog.ok.gov	Overlapping Address Range

Clearing the FieldValuesCheckResults Table After Using the Tool

As described in *Viewing Data*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear this table after running the Check Road ESN Values tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If the table is not cleared, output results from this and other tool runs will compound in the table.

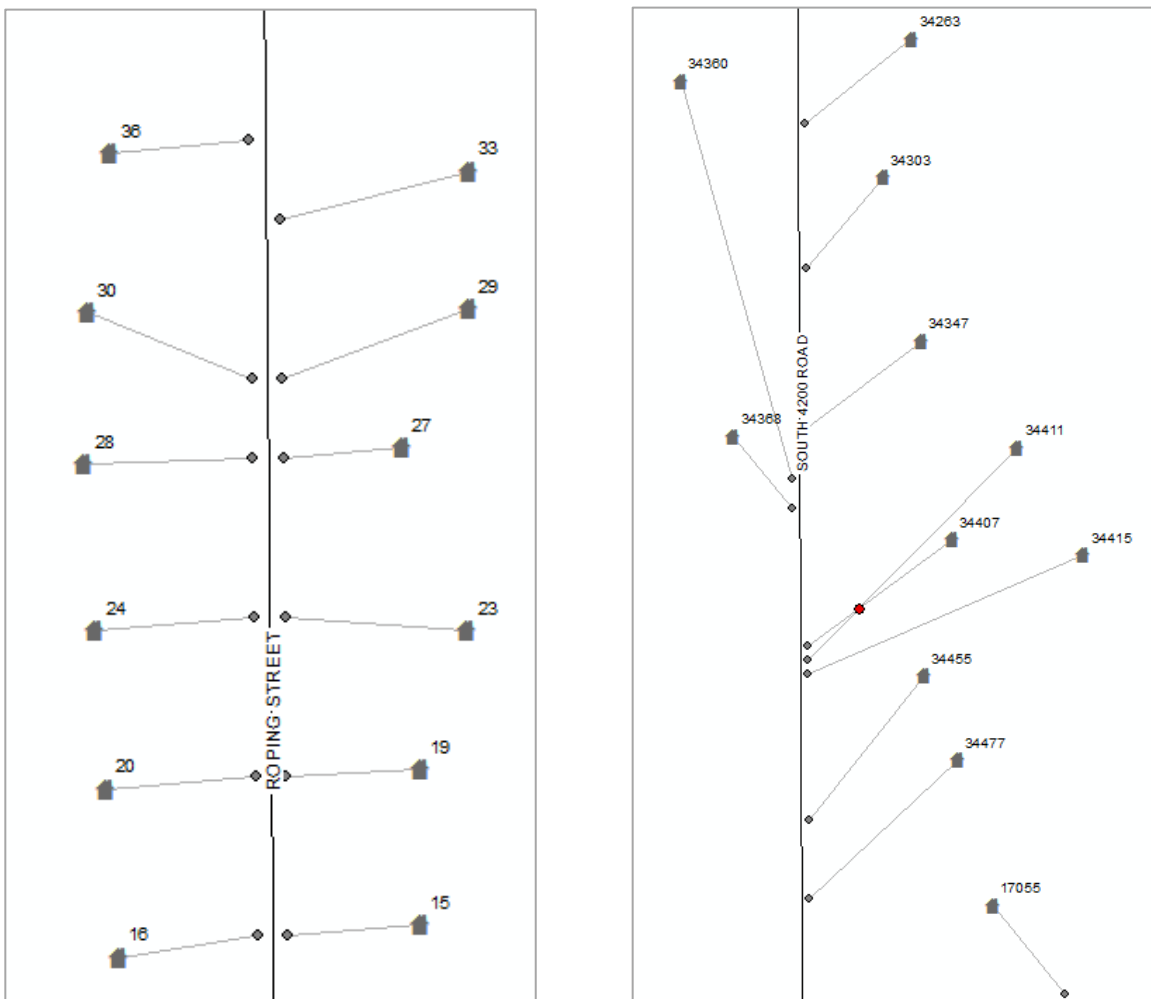
Generate Fishbone Analysis Tool

The Generate Fishbone Analysis Tool analyzes the geodatabase to produce a visual depiction of the geocoding and general health of addressing and road centerline range data. The fishbone analysis visualizes areas where road centerline ranges may be inaccurate or address points may be incorrectly ordered along the road centerline. This tool becomes an invaluable component of the QA/QC process for GIS data editors and GIS data authorities.

The Generate Fishbone Analysis tool outputs seven shapefiles as well as a locator for use in performing a manual fishbone analysis, described in detail below. Running **Calculate Label** (Enhancement toolset) before performing a fishbone analysis may prevent errors in geocoding.

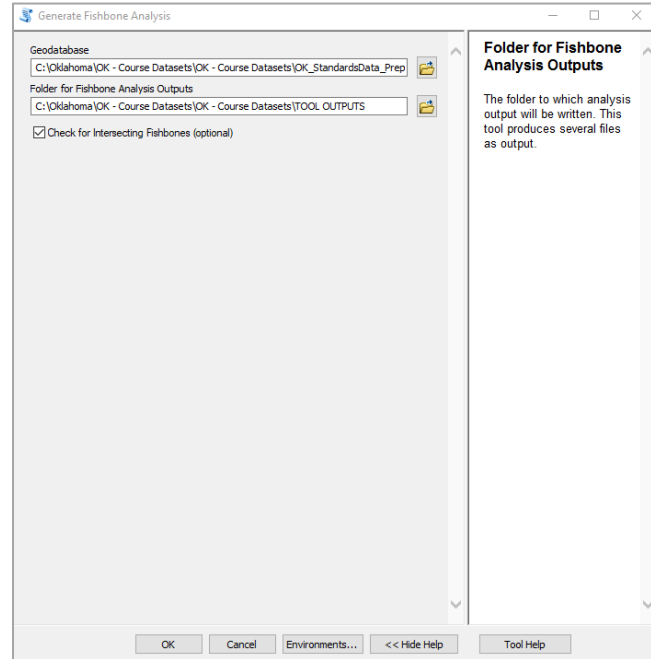
Example Fishbone Analysis Diagram

The figure on the left shows a Fishbone Analysis with no conflicts along the road segment. The Fishbone Analysis on the right shows a potential conflict between address points 34411 and 34407 requiring additional investigation as they appear out of order on the road segment. The Fishbone_Intersect.shp shapefile displays potential conflicts by creating a point at the intersection of the fishbone lines as shown in the figure on the right.



Open and Configure Generate Fishbone Analysis

- Create a new folder to store the outputs of the analysis
- Open Generate Fishbone Analysis
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Click the folder icon next to **Folder for Fishbone Analysis Outputs** to select the folder where fishbone analysis outputs will be stored
- Check the box next to **Check for Intersecting Fishbones**
This step is optional, but it visually identifies intersecting fishbones used to locate and address potential issues in the data



Run Generate Fishbone Analysis

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

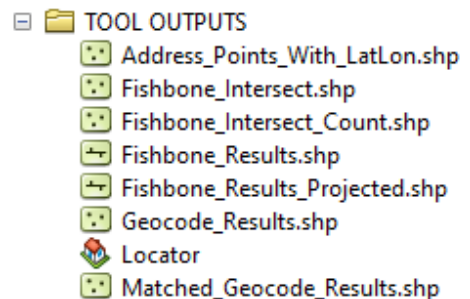
Progress and status of the Generate Fishbone Analysis tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Generate Fishbone Analysis tool. From Messages, scroll down to verify the tool ran successfully.

View the Results of the Generate Fishbone Analysis Tool

To view the results, expand the folder specified for outputs in the Catalog Tree. The TOOL OUTPUTS folder contains the following shapefiles and locator file, shown in the figure to the right.

Multiple Fishbone results can be added to an ArcMap session to be viewed together, or individual shapefiles can be previewed from within ArcCatalog.

The contents of each shapefile are described in the table below.



SHAPEFILE	DESCRIPTION
Address_Points_With_LatLon.shp	Output of ADDRESS_POINT which excludes NULL and zero values in latitude/longitude fields
Fishbone_Intersect.shp	Identifies the location where fishbones intersect
Fishbone_Intersect_Count.shp	Shows the number of fishbones intersecting at a location
Fishbone_Results.shp	Provides the fishbone line drawn between ADDRESS_POINT and the matched geocode results point
Fishbone_Results_Projected.shp	Fishbone results projected into State Plan Coordinate System
Geocode_Results.shp	Endpoint of the fishbone, the attribute table is a combination of the ADDRESS_POINT schema and geocode information
Matched_Geocode_Results.shp	Table containing only the matching records

Notes for GIS Editors

- Alternatively, files may be added to ArcMap
- Add the results of the fishbone analysis to ArcMap with ROAD_CENTERLINE and symbolize the feature class with an arrow at the end of the road segments to enhance the QC process and identify areas where road centerline ranges may be flipped and cause issues or anomalies in the data

Performing a Fishbone Analysis without using the Generate Fishbone Analysis Tool

Fishbone analysis of the addressing and road centerline data may be performed manually using ArcGIS, without running the Generate Fishbone Analysis tool. This provides a method of visualizing potential conflicts for those who directly analyze data in ArcGIS. Performing a manual Fishbone Analysis is a complex process that requires significant GIS experience.

Detailed instructions for are provided in the NG9-1-1 GIS Toolkit documents and include:

1) Create the Address Locator

This uses the ROAD_CENTERLINE feature class to generate an "Address Locator" in ArcGIS.

2) Geocode Addresses

This geocodes addresses with the Address Point feature Class and the Address Locator file.

3) Create the Fishbone Lines

This creates the final line feature class for the Address Point Fishbone Analysis.

4) Analyzing Fishbone Line Intersections

This points where fishbone lines intersect, showing GIS data authorities and data managers where potential data issues and conflicts may be located and should be investigated further.

Geocompare Address Points Tool

Geocompare Address Points compares ADDRESS_POINT and ROAD_CENTERLINE feature classes, populating Mandatory fields *RCLMatch* and *RCLSide* in ADDRESS_POINT with the results.

RCLMatch is populated with the NGUID of the corresponding ROAD_CENTERLINE segment, where one exists. Where no match is found, the value will be left blank. The *RCLSide* field is populated with the domain values of LEFT, RIGHT, or NO MATCH.

Open and Configure

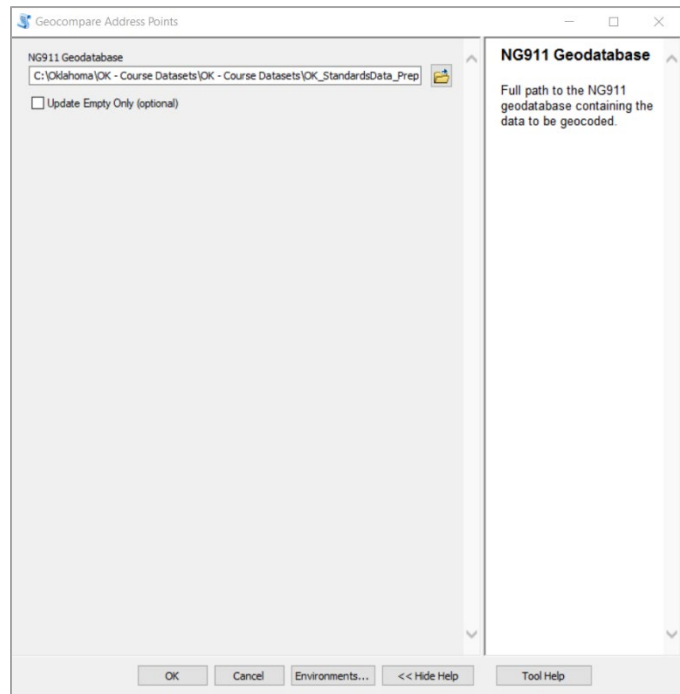
Geocompare Address Points

- Open Geocompare Address Points
- Click the folder icon next to **NG911 Geodatabase**, navigate to the geodatabase, and click **Add**
- Check the box next to **Update Empty Only** to use this tool to only update empty geometry values in the required *RCLMatch* and *RCLSide* fields

Note: This is optional; when selected, the tool will only update NULL/empty values in *RCLMatch* and *RCLSide*

Run Geocompare Address Points

Click the **OK** button to run the tool.



A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully. Progress and status of the Geocompare Address Points tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Geocompare Address Points tool. From Messages, scroll down to verify the tool ran successfully.

Populate RCLMATCH: NO_MATCH Tool

Populate RCLMATCH: NO_MATCH populates all NULL values in the RCLMatch field with NO_MATCH. It can also overwrite RCLMatch values of TIES with NO_MATCH, as an option.

RCLMatch is a Mandatory field per the Oklahoma NG9-1-1 and Address Standard and requires every value to be populated. **Populate RCLMATCH: NO_MATCH** is run after running the **Geocompare Address Points** tool to ensure all values in RCLMatch are populated.

Open and Configure

Populate RCLMATCH: NO_MATCH

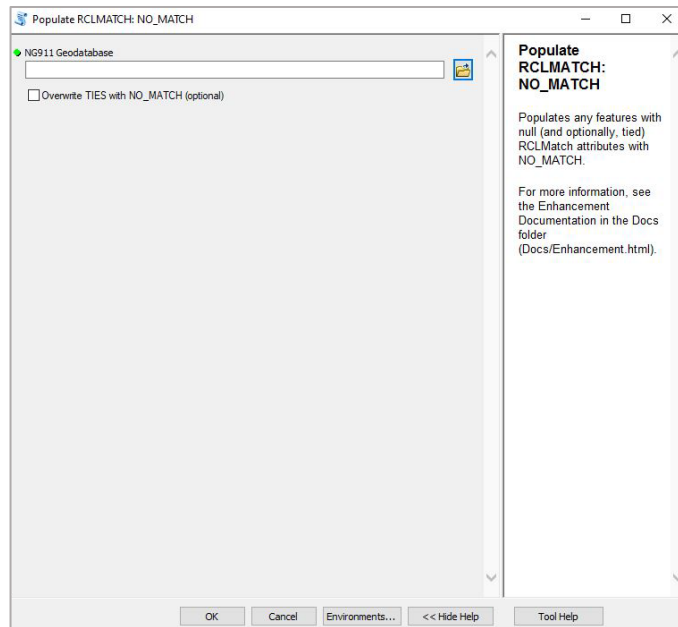
- Open Populate RCLMATCH: NO_MATCH
- Click the folder icon next to **NG911 Geodatabase**, navigate to the geodatabase, and click **Add**
- Click the button next to **Overwrite TIES with NO_MATCH**, if required

Run Populate RCLMATCH: NO_MATCH

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Populate RCLMATCH: NO_MATCH tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Populate RCLMATCH: NO_MATCH tool. From Messages, scroll down to verify the tool ran successfully.



Submission Toolset

Overview

Data submission tools are used to perform validation checks against the NG9-1-1 GIS Data Model template to determine if local Agency data is ready for submission into the State of Oklahoma NG9-1-1/GIS Repository. If the data does not pass validation checks, the geodatabase will not be considered ready for submission and the local Agency will be responsible for correcting issues in the data until it passes this toolset's validation checks.

Submission tools are also used to export feature classes as shapefiles, enabling them to be distributed independently of the geodatabase, and provide a utility to convert the supplied shapefile as a .zip file.

The Submission Toolset includes the following tools:

Check Data and Zip Tool

GDB to Shapefiles Tool

Zip NG911 Geodatabase Tool

Instructions for each tool begin on the following page.

Check Data and Zip Tool

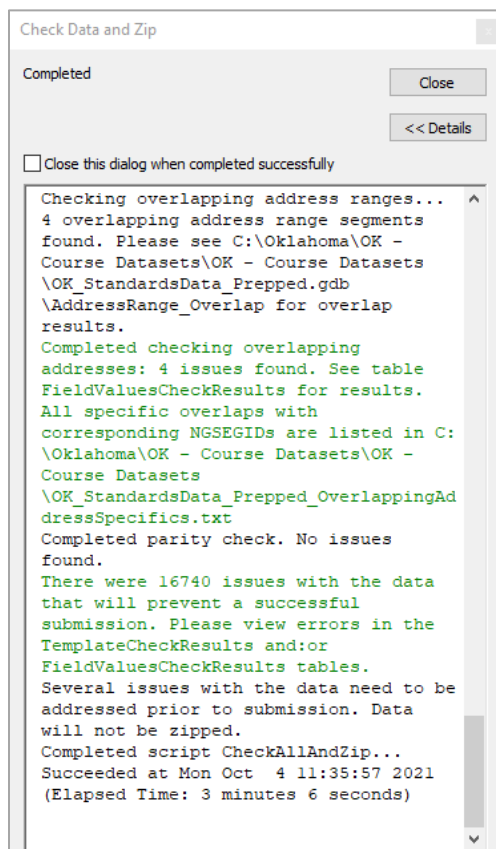
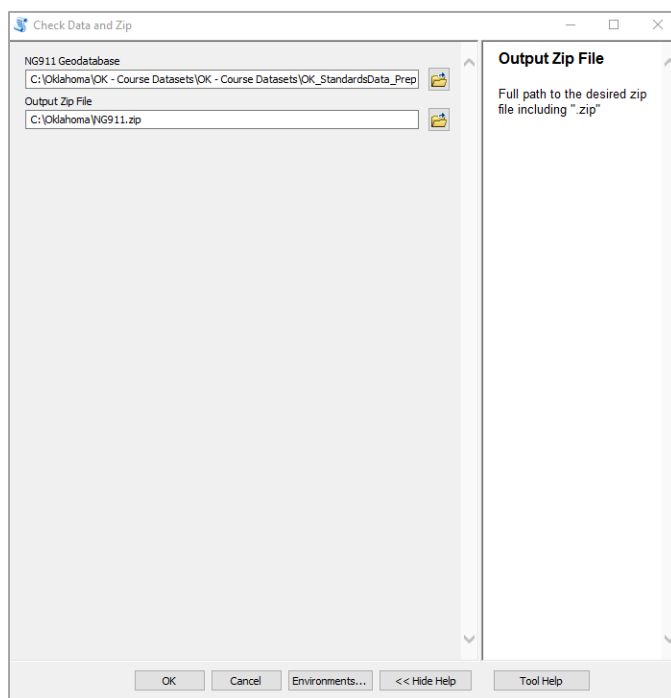
Check Data and Zip runs a complete series of validation checks on the geodatabase and if the dataset passes validations, it will be copied to a zip file for submission to the state repository.

Open and Configure Check Data and Zip

- Open Check Data and Zip
- Click the folder icon next to **NG911 Geodatabase**, navigate to the geodatabase, and click **Add**
- Click the folder icon next to **Output Zip File** and navigate to the folder location where the zip file should be stored
- Create a name for the **Output Zip File** and click **Save**; make sure to use the file extension “.zip” at the end of the file name

Run Check Data and Zip

Click the **OK** button to run the tool.



Tool Status and Working with Data Issues

A dialogue box will appear as the tool runs and provide a notification about the status of the tool.

If the dataset passes the tool’s validations, the output dataset will be zipped and stored in the location specified during configuration of the tool. Issues discovered by the tool will be reported in the **FieldValuesCheckResults** table.

Important If the tool encounters any issues within the data, the output dataset will not be zipped.

In the example shown to the left, data did not pass validations, and the output dataset was not zipped.

Progress and status of the Check Data and Zip tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check Data and Zip tool. From Messages, scroll down to verify the tool ran successfully.

GDB to Shapefiles Tool

GDB to Shapefiles exports all feature classes within the NG9-1-1 geodatabase and converts them into shapefiles.

Open and Configure GDB to Shapefiles

- Open GDB to Shapefiles
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Click the folder icon next to **Output Folder** and navigate to the folder for shapefiles to be saved
- Select the folder and click **Add**

Run Check Data and Zip

Click the **OK** button to run the tool.

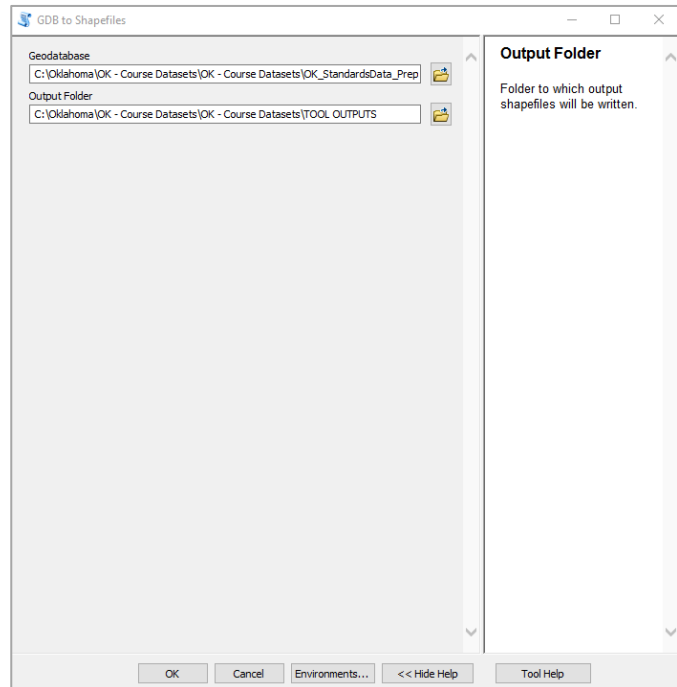
A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the GDB to

Shapefile tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the GDB to Shapefile tool. From Messages, scroll down to verify the tool ran successfully.

GDB to Shapefiles Tool Outputs

- 📁 TOOL OUTPUTS
 - 📄 ADDRESS_POINT.shp
 - 📄 DISCREPANCY AGENCY_BOUNDARY.shp
 - 📄 ESB_EMS_BOUNDARY.shp
 - 📄 ESB_FIRE_BOUNDARY.shp
 - 📄 ESB_LAW_BOUNDARY.shp
 - 📄 ESZ_BOUNDARY.shp
 - 📄 PSAP_BOUNDARY.shp
 - 📄 ROAD_CENTERLINE.shp



Feature classes that have been converted into shapefiles by the tool are saved in the specified output folder in the NG9-1-1 geodatabase.

The figure to the left shows feature classes which have been converted to shapefiles and saved in the TOOL OUTPUTS folder.

Zip NG911 Geodatabase Tool

Zip NG911 Geodatabase zips the geodatabase in preparation for submission to the state repository.

- Open Zip NG911 Geodatabase
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Click the folder icon next to **Zip File Output** and navigate to the folder location where the zipped geodatabase file should be stored
- Create a name for the zipped geodatabase and click **Save**; make sure to use the file extension “.zip” at the end of the file name

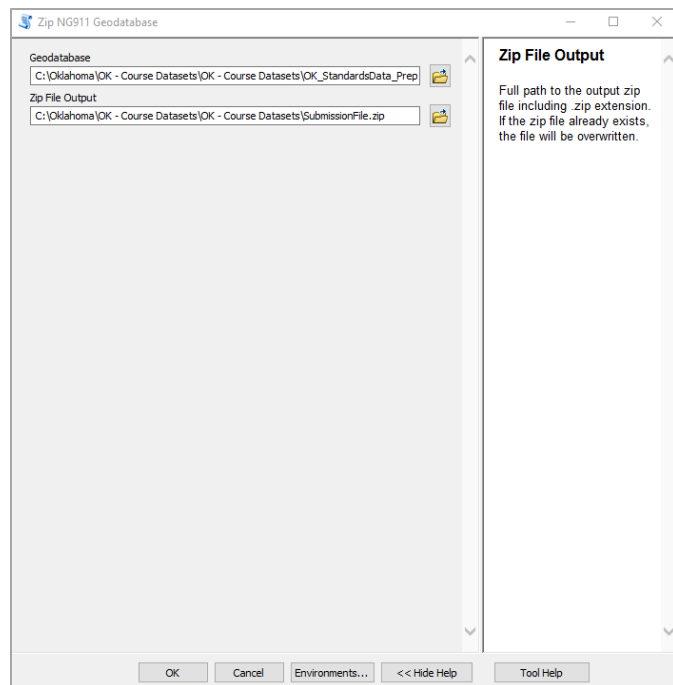
Run Check Data and Zip

Click the **OK** button to run the tool.

The geodatabase will be zipped and stored in the location specified during configuration of the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Zip NG911 Geodatabase tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Zip NG911 Geodatabase tool. From Messages, scroll down to verify the tool ran successfully.



Validation Toolset

Overview

Data validation tools perform basic verification checks against the NG9-1-1 GIS Data Model template to determine if local Agency data is ready for submission into the State of Oklahoma NG9-1-1/GIS Repository. Validation scripts are used to validate data by specific layers or groups of layers with optional tests included for each set of layers.

Validation scripts can be run on the data multiple times, as often as necessary, enabling local Agencies to identify issues in their data which require correction prior to submitting updated datasets to the repository. Validation tools identify, but do not correct, errors in the data. Issues within the data will be reported as an "Error" or a "Notice" through tables added to the geodatabase. Notices will not prevent the geodatabase from being submitted to the repository.

Validations may be run on individual data layers or on the entire NG9-1-1 geodatabase. Local GIS authorities and GIS editors should engage all stakeholders involved in maintaining the GIS data to develop a strategy for validating their GIS data and bringing it into compliance with the Standard.

The Validation Toolset includes the following tools, and instructions for each tool begin on the following page.

Check NENA ID Format Tool

Check Template Tool

Check Address Points Tool

Check Roads Tool

Check Boundaries Tool

Check Additional Layers Tool

Clear Results Table Tool

Verify Topology Exceptions Tool

ESB Gap Locations for Topology Tool

Check All Required Tool

Error Glossary

An Error Glossary has been added to the NG9-1-1 GIS Toolkit as a supplemental document to describe messages written to the geoprocessing console as well as the **TemplateCheckResults** and **FieldValuesCheckResults** tables.

The Error Glossary is maintained as an HTML document, accessed by opening the README file and clicking the **Error Glossary** bookmark from the list of Supplementary Documents. The Error Glossary is maintained as a working document and provides the most recent revision date.

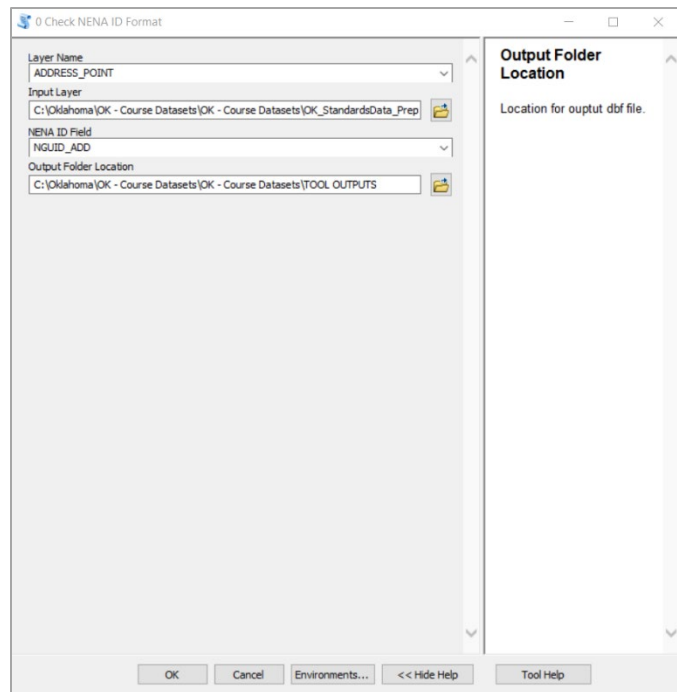
Check NENA ID Format Tool

Check NENA ID Format verifies the correct format of the [NGUID](#) field within a specific data layer.

Open and Configure

Check NENA ID Format

- Open Check NENA ID Format
- For **Layer Name**, select the layer containing the NENA ID being verified
- Click the folder icon next to **Input Layer**, navigate to the layer that corresponds to the **Layer Name** selected in the previous step, and click **Add**
- For **NENA ID Field**, select the [NGUID](#) field for the layer from the dropdown list
- Click the folder icon next to **Output Folder Location**, navigate to the location of the output folder, and click **Add**



Note: the Output Folder Location is required, but no results will be output to this folder. Results of the NENA ID Format tool are displayed in the notification window after the tool runs.

Run Check NENA ID Format

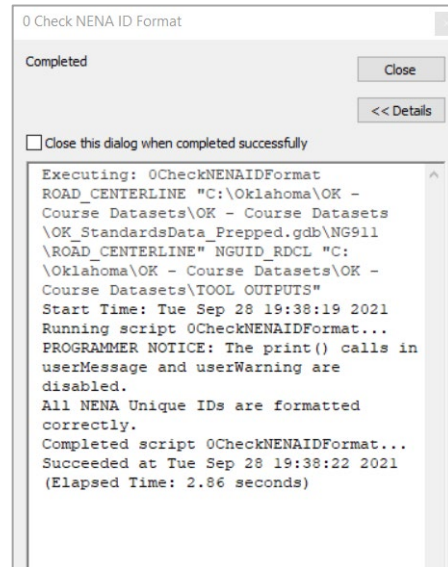
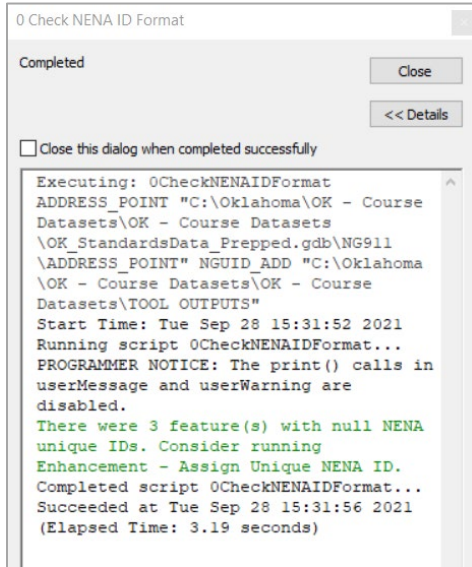
Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification on the ID format when the tool runs successfully.

Progress and status of Check NENA ID Format can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check NENA ID Format tool. From Messages, scroll down to verify the tool ran successfully.

Viewing the Results of the Check NENA ID Format Tool

As noted above, the results of the NENA ID Format tool are displayed in the notification window which appears after the tool runs as shown in the figures below.



Update Incorrect/Incomplete Unique IDs with the Results of the Check NENA ID Format Tool

NGUID is a Mandatory field per the Oklahoma NG9-1-1 and Address Standard and requires a correctly formatted unique ID to maintain compliance with the Standard. Any features with NULL values or incorrectly formatted unique IDs identified by the Check NENA ID Format tool must be resolved.

Check Template Tool

Check Template compares the NG9-1-1 geodatabase against a template following the Oklahoma NG9-1-1 and Address Standard, examining it for data compliance and completeness. One or all of the following checks may be performed on the geodatabase:

CHECK	DESCRIPTION
Check Layer List	Examines if all required layers are present in the geodatabase and checks for a feature dataset named NG911
Check Required Fields	Examines if all required fields are present within the feature classes
Check Required Field Values	Returns errors if required fields contain NULL values
Check Submission Counts	Checks how many features are marked for submission
Find Invalid Geometry	Returns errors if points, lines, or polygons have fewer than 1, 2, or 3 points, respectively
Check GDB Domains	Returns errors if geodatabase domains are not standards compliant

Open and Configure Check Template

- Open Check Template
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Select the check or checks to be performed on the geodatabase

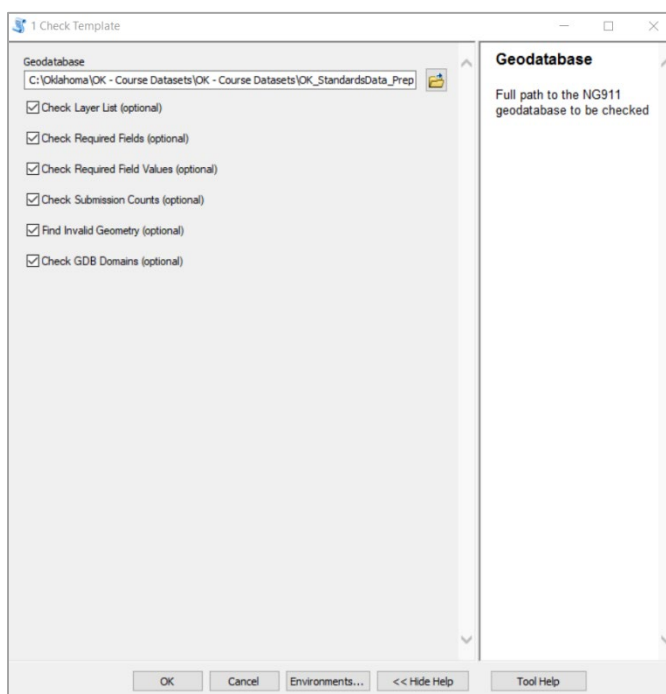
Run Check Template

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check Template tool can also be monitored in ArcCatalog.

From Geoprocessing > Results, expand Current Session then select the Check Template tool. From Messages, scroll down to verify the tool ran successfully.



View the Results of the Check Template Tool

Based on the checks performed and the condition of the geodatabase, results are reported in the **TemplateCheckResults** or **FieldValuesCheckResults** tables. To view the results, select either of these tables in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap.

Clearing the Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Check Template tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.

Check Address Points Tool

Check Address Points performs the following checks on the ADDRESS_POINT feature class and reports the results to the FieldValuesCheckResults table. One or all of the following checks may be performed on the ADDRESS_POINT feature class.

CHECK	DESCRIPTION
Check Values Against Domains	Verifies the domains in the feature class are standards compliant <u>Check MSAGComm Spaces</u> checks for and removes leading and trailing spaces in MSAGComm fields <u>Check RCLMatch</u> validates RCLMatch within ADDRESS_POINT against ROAD_CENTERLINE feature class
Check Feature Locations	Compares ADDRESS_POINT features to DISCREPANCYAGENCY_BOUNDARY to determine if any addresses lie outside the boundary
Check Address Point Frequency	Checks for duplicate addresses and returns errors if any are identified
Check Unique ID	Verifies all NGUIDs are unique and formatted correctly
Check ESN and Muni Attributes	Verifies ESN and CITY attributes in ADDRESS_POINT against ESN within ESZ_BOUNDARY

Open and Configure Check Address Points

- Open Check Address Points
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Select the check or checks to be performed on the geodatabase

Run Check Address Points

Click the **OK** button to run the tool.

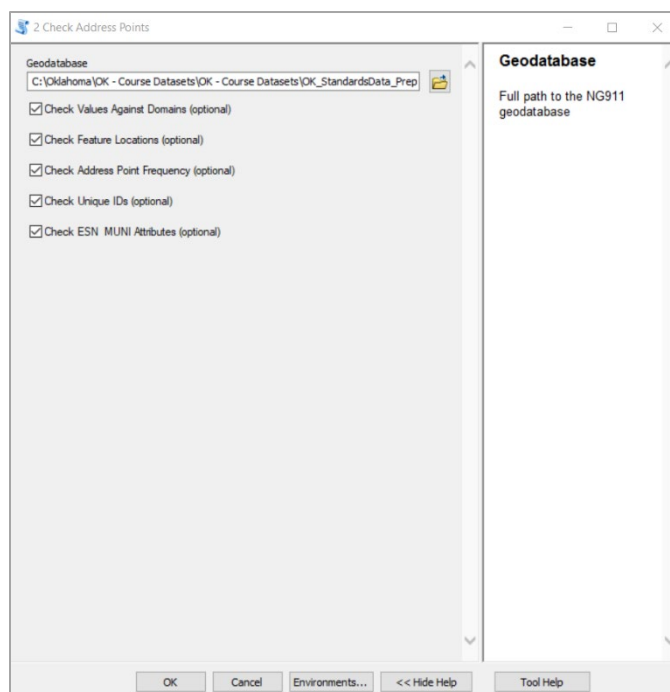
A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check Address Points tool can also be monitored in ArcCatalog. From Geoprocessing >

Results, expand Current Session then select the Check Address Points tool. From Messages, scroll down to verify the tool ran successfully.

View the Results of the Check Address Points Tool

Results are reported in the **FieldValuesCheckResults** table. To view results, select the table in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap.



Clearing the Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Check Address Points tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.

Check Roads Tool

Check Roads performs the following checks on the ROAD_CENTERLINE feature class and reports the results to the FieldValuesCheckResults table. One or all of the following checks may be performed on the ROAD_CENTERLINE feature class.

CHECK	DESCRIPTION
Check Values Against Domains	Verifies the domains in the feature class are standards compliant <u>Check MSAGComm Spaces</u> checks for and removes leading and trailing spaces in MSAGComm fields <u>Check Parities</u> returns a notice if address ranges do not match parity fields
Check Feature Locations	Compares ROAD_CENTERLINE features to DISCREPANCYAGENCY_BOUNDARY to determine if any road centerlines lie outside the boundary
Check Unique ID	Verifies all NGUIDs are unique and formatted correctly
Check for Cutbacks	Returns a notice when a road centerline feature contains an angle on the open interval which may indicate a cutback
Check Directionality	Ensures all address ranges run from low to high numbers <u>Check Topology</u> (only road centerlines) generates and validates topology rules for road centerline features
Check Overlapping Address Ranges	Checks for numerical overlaps in address ranges between road centerline features

Open and Configure Check Roads

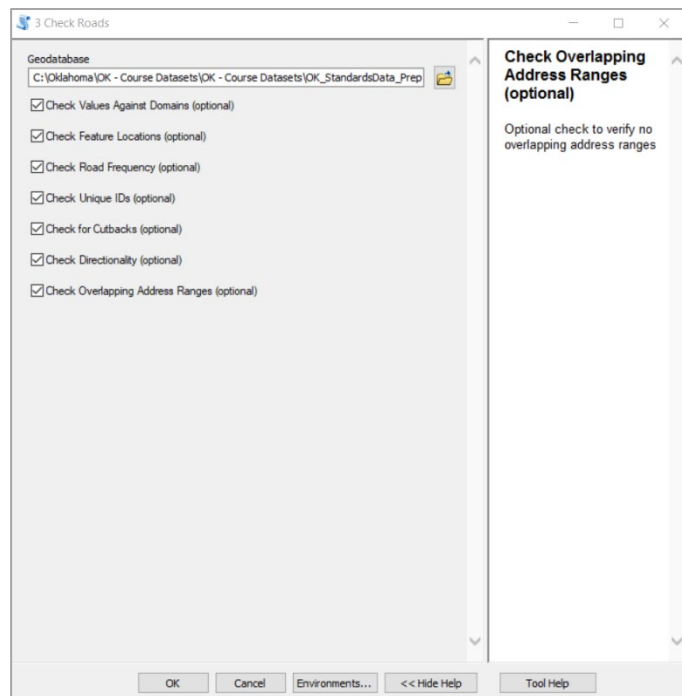
- Open Check Roads
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Select the check or checks to be performed on the geodatabase

Run Check Roads

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check Roads tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check Roads tool. From Messages, scroll down to verify the tool ran successfully.



View the Results of the Check Roads Tool

Results are reported in the **FieldValuesCheckResults** table. To view results, select the table in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap.

Clearing the Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Check Roads tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.

Check Boundaries Tool

Check Boundaries performs the following checks on NG9-1-1 boundary feature classes and reports the results to the FieldValuesCheckResults table. One or all of the following checks may be performed on the boundary feature classes.

CHECK	DESCRIPTION
Check Values Against Domains	Verifies the domains in the feature class are standards compliant
Check Feature Locations	Compares feature classes to DISCREPANCYAGENCY_BOUNDARY to ensure they lie within the boundary
Check Unique ID	Verifies all NGUIDs are unique and formatted correctly

Open and Configure Check Boundaries

- Open Check Boundaries
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Select the check or checks to be performed on the geodatabase

Run Check Boundaries

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check Boundaries tool can also be monitored in ArcCatalog. From Geoprocessing >

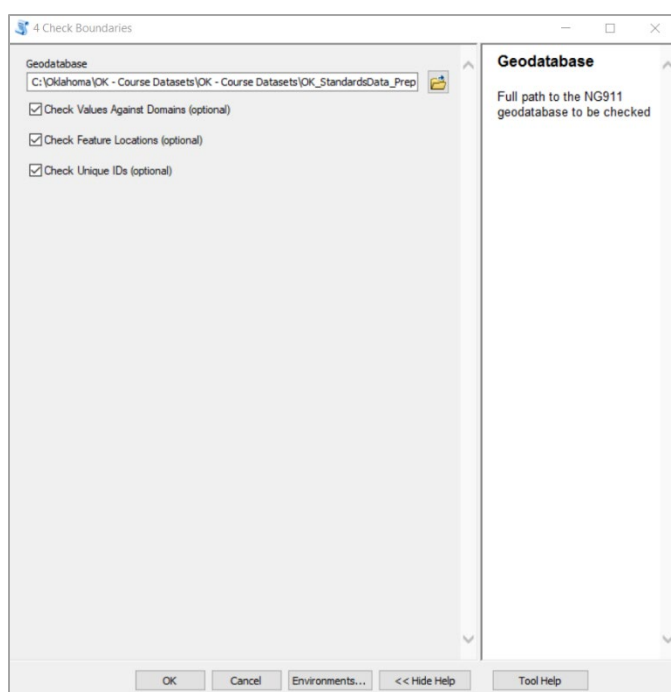
Results, expand Current Session then select the Check Boundaries tool. From Messages, scroll down to verify the tool ran successfully.

View the Results of the Check Boundaries Tool

Results are reported in the **FieldValuesCheckResults** table. To view results, select the table in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap.

Clearing the Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Check Boundaries tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.



Check Additional Layers Tool

Check Additional Layers performs the following checks on non-required feature classes and reports the results to the FieldValuesCheckResults table. One or all of the following checks may be performed on the boundary feature classes.

CHECK	DESCRIPTION
Check Values Against Domains	Verifies the domains in the feature class are standards compliant
Check Feature Locations	Compares feature classes to DISCREPANCYAGENCY_BOUNDARY to ensure they lie within the boundary
Check Unique ID	Verifies all NGUIDs are unique and formatted correctly

Open and Configure Check Additional Layers

- Open Check Additional Layers
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Select the check or checks to be performed on the geodatabase

Run Check Additional Layers

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

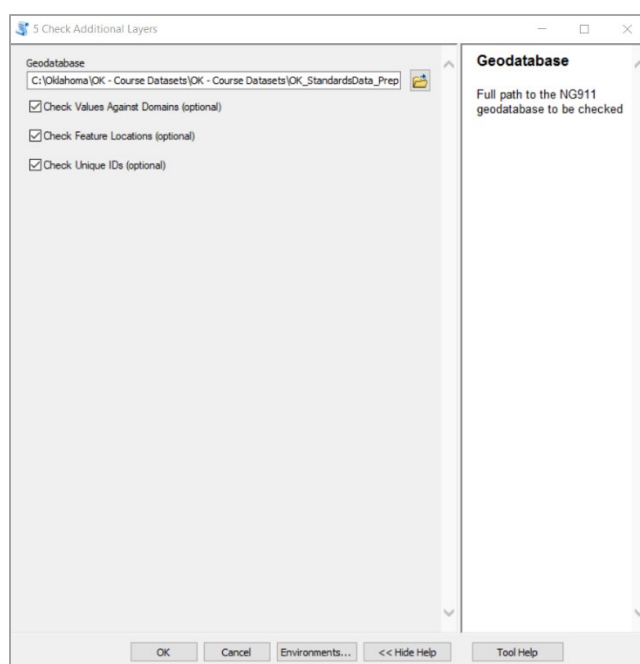
Progress and status of the Check Additional Layers tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check Additional Layers tool. From Messages, scroll down to verify the tool ran successfully.

View the Results of the Check Additional Layers Tool

Results are reported in the **FieldValuesCheckResults** table. To view results, select the table in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap.

Clearing Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Check Additional Layers tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.



Clear Results Table Tool

As described in *Viewing Data Results*, many of the Validation toolset's tools output results to either the **FieldValuesCheckResults** table or the **TemplateCheckResults** table. This tool supports the recommended best practice to clear table results after running each tool to prevent multiple tools or checks from compounding data in the results tables.

Open and Configure Clear Results Table

- Expand Validation Tools and open Clear Results Table
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**
- Check the box next to each results table to clear its respective field values

Run Clear Results Table

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

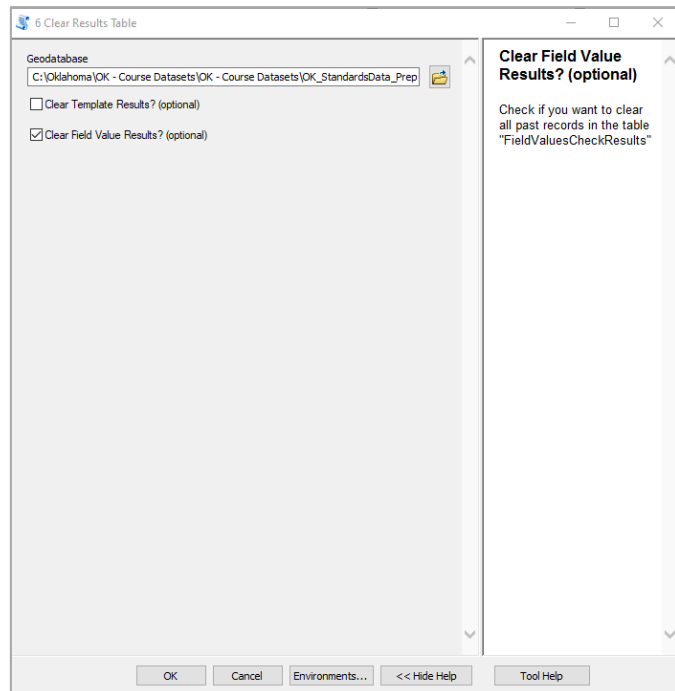
Progress and status of the Clear Results

Table tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Clear Results Table tool. From Messages, scroll down to verify the tool ran successfully.

Viewing/Verifying the Cleared Results Tables

Click the **FieldValuesCheckResults** or **TemplateCheckResults** table from within the Catalog Tree, then click the Preview tab. The table's fields should be visible but the table itself should not contain results values, following a successful run of this tool.

The figures below show a populated results table, prior to being cleared, and what the table will look like after running the Clear Results Table tool.



Verify Topology Exceptions Tool

Verify Topology Exceptions reports topology errors recorded as exceptions in the data and in the topology. This tool generates feature classes of the topology errors found in each of the data layers. Results are reported in the FieldValuesCheckResults table.

Open and Configure Verify Topology

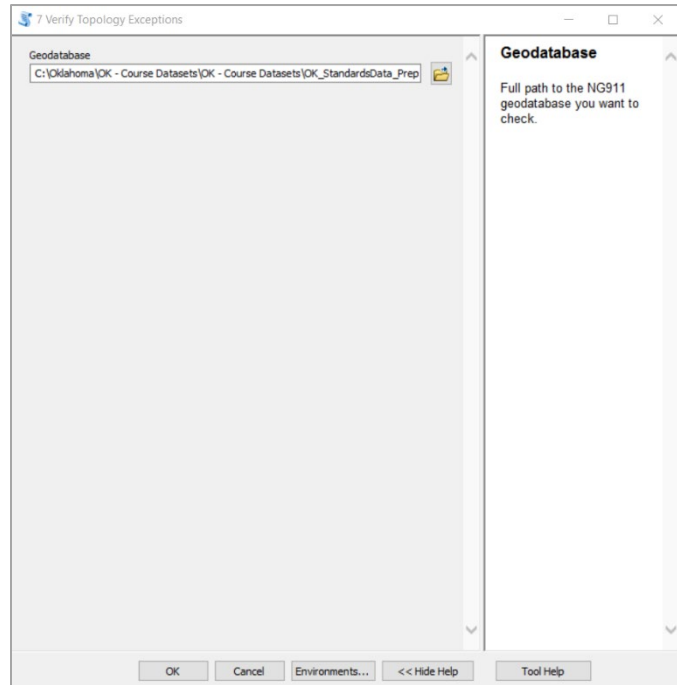
- Open Verify Topology Exceptions
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**

Run Verify Topology Exceptions

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Verify Topology Exceptions tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Verify Topology Exceptions tool. From Messages, scroll down to verify the tool ran successfully.



View the Results of the Verify Topology Exceptions Tool

Results are reported in the **FieldValuesCheckResults** table. To view results, select of the table in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap. Additionally, the tool will generate feature classes containing the topology errors in the NG9-1-1 geodatabase. To view these, select the feature class from the Catalog Tree.

Clearing Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Verify Topology Exceptions tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.

ESB Gap Locations for Topology Tool

ESB Gap Locations identifies areas where ESB feature classes do not overlap with the DISCREPANCYAGENCY_BOUNDARY feature class. This tool creates feature classes of the topology anomaly areas in the NG9-1-1 geodatabase.

Open and Configure

ESB Gap Locations for Topology

- Open ESB Gap Locations for Topology
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**

Run ESB Gap Locations for Topology

Click the **OK** button to run the tool.

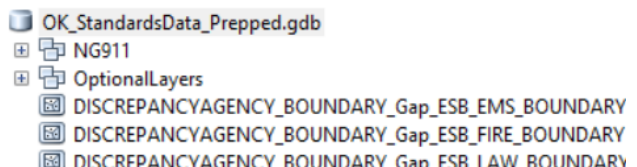
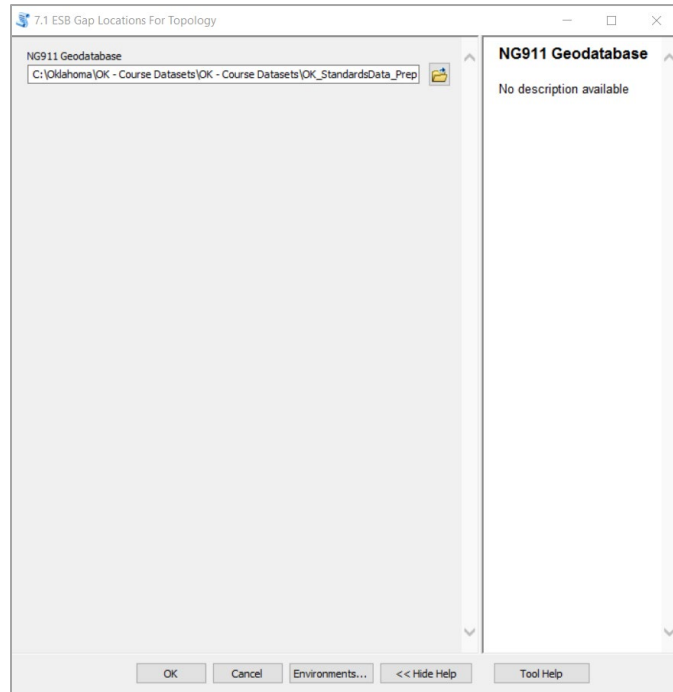
A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the ESB Gap Locations For Topology tool can also be monitored in ArcCatalog. From

Geoprocessing > Results, expand Current Session then select the ESB Gap Locations For Topology tool. From Messages, scroll down to verify the tool ran successfully.

View the Results of the ESB Gap Locations for Topology Tool

Results are provided as new feature classes in the NG9-1-1 geodatabase. To view results, select the feature class from the Catalog Tree as shown in the figure to the right.



Check All Required Tool

Check All Required provides GIS data managers and editors the ability to perform all required validation checks on the NG9-1-1 geodatabase with a single tool run. Results are reported to FieldValuesCheckResults, and any topology anomalies are exported as feature classes and stored within the geodatabase.

Template Checks

- Clear Old Results
- Check Layer List
- Check GDB Domains
- Check Required Fields
- Check Required Field Values
- Check Submission Numbers
- Find Invalid Geometry

Address Point Layer Checks

- Check MSAGComm Spaces
- Check RCLMatch
- Check Frequency
- Check ESN and Muni Attribute

Common Layer Checks

- Check Values Against Domain
- Check Feature Locations
- Check Topology *
- Check Unique ID – Format and Frequency

Road Centerline Layer Checks

- Check MSAGComm Spaces
- Check Frequency
- Check Cutbacks
- Check Directionality
- Check Frequency (of dual carriageways)
- Find Overlaps
- Check Parities

* Note: Check Topology is run on road and polygon features, unlike in **main_check**, where it is only run on road features

Open and Configure Check All Required

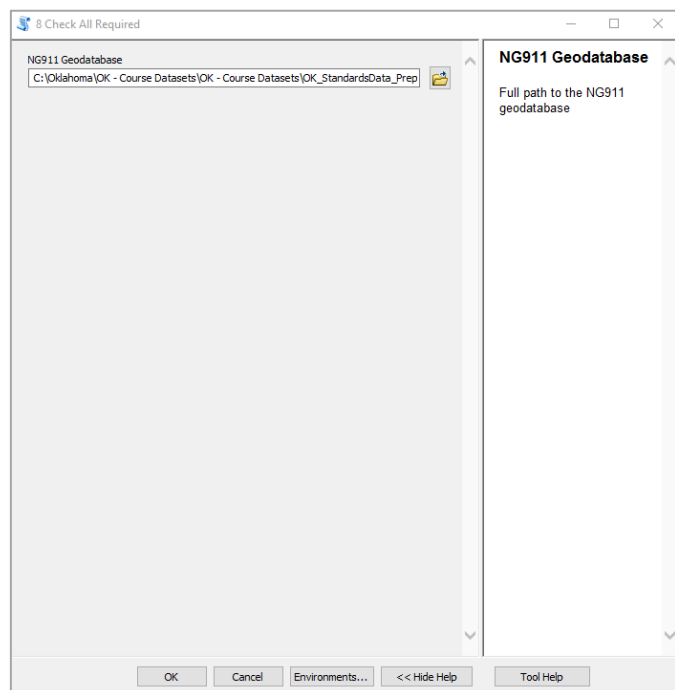
- Open Check All Required
- Click the folder icon next to **Geodatabase**, navigate to the geodatabase, and click **Add**

Run Check All Required

Click the **OK** button to run the tool.

A dialogue box will appear as the tool runs and provide a notification when the tool runs successfully.

Progress and status of the Check All Required tool can also be monitored in ArcCatalog. From Geoprocessing > Results, expand Current Session then select the Check All Required tool. From Messages, scroll down to verify the tool ran successfully.



View the Results of the Check All Required Tool

Results of the required validations and checks performed by the Check All Required tool are reported in the **FieldValuesCheckResults** and **TemplateCheckResults** tables, with topology errors captured in feature classes generated by the tool within the geodatabase. To results, select the **FieldValuesCheckResults** or the **TemplateCheckResults** table in the Catalog Tree and click the Preview tab. The table can also be viewed in ArcMap. To view feature classes created for topology errors, select the feature class from the Catalog Tree.

Clearing Results Tables After Using the Tool

As described in *Viewing Data Results*, GIS data managers are advised to use the **Clear Results Table** tool in the Validation Toolset to clear results tables after running the Check All Required tool and finishing any work in the geodatabase driven by the results/data provided by the tool. If results tables are not cleared, output from this and other tool runs will be compounded.