# NG911 ESB Adjustment Instructions

By Kristen Jordan Koenig, December 2019, [kristen.kgs@ku.edu](mailto:kristen.kgs@ku.edu)

### ESB Adjustment Purpose

One of the requirements to transition to full i3 geospatial call routing is statewide seamless ESB layers. Kansas ESB layers such as EMS, Fire, and Law need to have no gaps or overlaps for PSAPs participating in the state-hosted system. The Kansas NG911 Coordinating Council adopted a seamless PSAP layer several years ago, so this NG911 ESB Adjustment process works to align existing ESB boundaries with the seamless PSAP boundaries. For continuity, this process will also adjust ESZ boundaries.

### Good Stuff to Know

* Please run the toolbox on a copy of the geodatabase that has no spaces in its entire path name. This includes avoiding spaces in all nested folder names. This is due to one of Esri’s tools not being able to process data paths with spaces in them.
* This toolbox is compatible with ArcPro and ArcDesktop versions 10.4 and higher
* Link to YouTube “ESB Adjustment Steps”- <https://youtu.be/s1zSmBVg6e0> (additional YouTube links are in process steps for action-specific topics)

### ESB Adjustment Process Expectations

This toolset is intended to import a copy of your PSAP’s boundary from the seamless statewide layer. Kansas NG911 Data Maintainers are expected to visually inspect the boundary for acceptability as the PSAP’s authoritative area. The boundary is not intended to be a county or legal boundary, the PSAP boundary is used for routing 911 calls.

Once the boundary is deemed acceptable, the toolset will generate copies of ESB, ESZ, utility and other user-defined layers that will be adjusted to the seamless PSAP boundary through Esri geoprocessing tools such as unions & clips. This step will most likely generate multi-part polygons without any attributes to cover any gaps. The NG911 Data Maintainer is expected to split and merge these blank polygons into existing polygons to create seamless layers.

After the layers are seamless, the toolset will edit the geodatabase schema to create archive copies of adjusted data then rename the adjusted layers to expected Kansas NG911 Data Model names. The authoritative boundary will be updated to reflect the PSAP from the seamless statewide layer. The toolset will also recreate NG911 geodatabase topology and validate it. The NG911 Data Maintainer is expected to review topology issues and either edit data or mark data as topology exceptions.

Once topology reviews are complete, the toolset can automatically mark any road segments that are outside the authoritative boundary as exceptions. The NG911 Data Maintainer is expected to make sure the entire NG911 geodatabase passes validation tests.

Finally, the NG911 Data Maintainer is expected to make a submission to the NG911 Portal and mark Address Points, Road Centerline, and all ESB, ESZ, utility, and other adjusted layers as having updates.

### Running ESB Adjustment Tools

Prep step: Create a backup copy of your NG911 geodatabase. The toolbox does not perform this step.

1. Import the PSAP boundary
   1. In the NG911 toolbox download folder, navigate to the ESB Adjustment toolbox.
   2. Open “1. Import PSAP” and enter the full path to the geodatabase you want to edit.
   3. Run the tool and note that a layer named “PSAP\_temp” has been added to your geodatabase.
   4. Visually review the boundaries of “PSAP\_temp” in mapping software. PSAP\_temp will most likely be slightly off from your current data, and that’s ok. The review is to check for bad errors that will need to be worked through with your neighbors.
   5. If you find bad errors that require attention:
      1. Please email Sherry Massey, Eileen Battles, and Kristen Jordan Koenig ([smassey@dkcoks.org](mailto:smassey@dkcoks.org), [battles@kgs.ku.edu](mailto:battles@kgs.ku.edu), [kristen@kgs.ku.edu](mailto:kristen@kgs.ku.edu))
      2. If you would like to start working on the issue with your neighbor and don’t know who their GIS Data Maintainer is, all PSAP data maintainers and their contact information (to the best of our knowledge, perfection not guaranteed) is in the KansasNG911GISTools folder. Under the PSAP\_Data folder, there is a PSAP\_Data.gdb and two PSAP layers, one for Kansas State Plane North (PSAP\_3419) and one for Kansas State Plane South (PSAP\_3420). You can find contact information in the attribute table of the appropriate layer.
2. Create adjusted feature classes
   1. In the ESB Adjustment toolbox, open “2. Adjust ESB/ESZ/UT.”
   2. Enter the full path to the geodatabase you’re working in and run the tool.
   3. In the NG911 feature dataset, you’ll see that ESB, ESZ, and any utility layers with features will have new copies with “\_NEW” appended to the end.
   4. If you have additional full-coverage polygons that should also be adjusted to a new authoritative boundary, open “2.5. Optional- Adjust Other” in the ESB Adjustment toolbox. Enter the full path to the geodatabase, then enter in any additional feature classes you want adjusted. These could be additional layers like a county-wide municipal boundary, other ESB layers, or anything else in your geodatabase that you want adjusted. Click ok, and these layers will be adjusted as well.
   5. All adjusted layers will need some editing before they are ready for next steps.
   6. If you look at the attribute tables of adjust layers, you’ll notice there is a feature without any attributes. This feature represents any gaps that existed between your existing layers and the imported PSAP boundary.
   7. For detailed editing instructions, please watch the appropriate YouTube video
      1. ArcMap- <https://youtu.be/qskzmZ6zvfo>
      2. ArcPro- <https://youtu.be/PNRqvqYTcec>
   8. In a nutshell, you’ll need to explode the multi-part feature, split any features that cross boundaries, then merge the small pieces into existing boundaries. You may also need to make other edits as necessary.
3. Reorganize geodatabase layers
   1. In the ESB Adjustment toolbox, open “3. Reorganize Layers.”
   2. Enter the full path to the geodatabase you’re working in and run the tool.
   3. This tool will make archive copies of any adjusted layers and the authoritative boundary in the “NG911\_local” feature dataset, then reorganize the \_NEW layers into the typical NG911 geodatabase format. It also refreshes your NG911 topology.
   4. When the NG911 topology is refreshed, it will “forget” all exceptions you’ve previously marked. Any road centerline exceptions that have been marked in the attribute table will not show up as Errors when running the Validation Tools; however, you might want to recreate those road exceptions in the topology.

**ArcMap**

* + 1. YouTube video- <https://youtu.be/HNlQXPo0WCI>
    2. In an MXD with the road centerlines and the NG911\_Topology, start an edit session and open the topology error inspector.
    3. In the Show: box, select RoadCenterline – Must Not Have Dangles then click “Search Now.”
    4. Highlight all the records present in the Error Inspector, then right click and choose “Select Features.”
    5. Open the Road Centerline attribute table and review the selected records’ EXCEPTION entries. If all the selected records have “EXCEPTION TO DANGLES RULE” or similar values, you can then right click in the error inspector again and choose “Mark as Exception.”
    6. Save your edits and close your edit session.

**ArcGIS Pro**

1. YouTube video- <https://youtu.be/MdT3x1YBxDU>
2. Bring the NG911\_Topology and road centerlines into an ArcPro Project. From the Edit ribbon, open the Error Inspector.
3. Make sure Source: is pointing to NG911\_Topology and then click the first Filter: button and select RoadCenterline – Must Not Have Dangles to narrow down the results.
4. Highlight all the dangle records, then click the button on the far right of the Error Inspector’s toolbar to Select Features.
5. Open the Road Centerline attribute table and review the selected records’ EXCEPTION entries. If all the selected records have “EXCEPTION TO DANGLES RULE” or similar values, you can then navigate to the “Fix” tab in the error inspector and click on Mark as Exception. This may take a while.
6. Save your edits.
7. Run validation checks
   1. In the ESB Adjustment toolbox, open “4. Run Validation Checks.”
   2. Enter the full path to the geodatabase you’re working in and run the tool.
   3. This tool is the normal validation check for the NG911 geodatabase.
   4. Review the results and make edits as necessary, paying particular attention to any road or address point features with topology issues. Road segments that fall outside the authoritative boundary can either be moved or marked as exceptions. Hint: for any roads you want to mark as exceptions, the next tool will mark them en masse, so don’t edit those or try to remove them from FieldValuesCheckResults in any way.
   5. Run this tool or the layer-specific Validation Tools as many times as necessary.
8. Mark road exceptions
   1. In the ESB Adjustment toolbox, open “5. Mark Road Exceptions.”
   2. Note: For this tool to work, the table FieldValuesCheckResults must exist & have results present for 'Error: Feature not inside authoritative boundary.' This tool will mark ALL those records as having exceptions, so make sure the only records in FieldValuesCheckResults with this error are ones you want to create as exceptions.
   3. Enter the full path to the geodatabase you’re working in and run the tool.
   4. Run “4. Run Validation Checks” again to verify your geodatabase is passing all validation checks.
9. Submit data to NG911 Portal
   1. Make a normal submission to the NG911 Portal
   2. Mark address points, road centerlines, and all ESB/ESZ layers (as well as any other layers that were edited) as having had updates so they are processed in the Portal.

Support Contact:

For issues or questions, please contact Kristen Jordan Koenig with the Kansas Data Access and Support Center. Email Kristen at [Kristen.kgs@ku.edu](mailto:Kristen.kgs@ku.edu) and please include in the email which script you were running, any error messages, and a zipped copy of your geodatabase (change the file extension from zip to piz so it gets through the email server).

Disclaimer: The Kansas NG9-1-1 GIS Toolbox is provided by the Kansas 911 Coordinating Council, Kansas GIS Policy Board’s Data Access & Support Center (DASC), and associated contributors "as is" and any express or implied warranties, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose are disclaimed. In no event shall the Kansas 911 Coordinating Council, DASC, or associated contributors be liable for any direct, indirect, incidental, special, exemplary, or consequential damages (including, but not limited to, procurement of substitute goods or services; loss of use, data, or profits; or business interruption) however caused and on any theory of liability, whether in contract, strict liability, or tort (including negligence or otherwise) arising in any way out of the use of this software, even if advised of the possibility of such damage.