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Nebraska NG911 GIS Boundary Resolution Workflow

Final Report

PREPARED JUNE 2019 FOR THE
SERVICE SYSTEM ADVISORY COMMITTEE
GIS WORKING GROUP

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1 Authority

As defined within Legislative Bill 993 (LB993), the 911 Service System Advisory Committee (SSAC) is responsible for making recommendations to the Public Service Commission (PSC) on the implementation, coordination, operation, management and funding of the 911 Service System as the state prepares and embarks upon deployment of Next Generation 911 (NG911)

The SSAC developed a GIS working group to support developing these recommendations and setting the path towards NG911 statewide. This standard operating procedure (SOP) was created by the GIS Working Group to standardize the approach to boundary resolution across the state.

2 Background

The migration to Next Generation 911 (NG911) technology in the State of Nebraska (State) requires the resolution of public safety answering point (PSAP) boundaries between jurisdictions in the state and between Nebraska jurisdictions and those in neighboring states. The GIS Working Group seeks to assist Nebraska PSAPs in developing seamless boundary coverage across the state and region. This workflow details the process necessary to achieve this goal.

It is vital to remember that the resultant PSAP boundary polygons are for 911 call routing only. These boundaries are not legal-ownership boundaries nor are they representative of tax parcels, legal descriptions, or other political boundaries. The PSAP boundary polygons will be used to route 911 calls to the appropriate PSAP. The end goal is to minimize call transfers and related delays in the delivery of emergency services. PSAP leadership will make boundary decisions based on historical response experience, first-due and mutual-aid agreements and other logistical factors.

3 Setup

There are 258 unique boundaries surrounding the Nebraska PSAPs. Just under half – 45 percent – of these boundaries are shared with counties in neighboring states. It is imperative that the GIS Working Group, the SSAC, and the PSC promote the cross-state collaboration necessary to build seamless call routing boundaries for the larger region.

With the understanding that cross-state collaboration will take time, Nebraska jurisdictions should first begin working on the 179 boundaries internal to the state. The first step is for jurisdictions sharing a boundary to select a starting dataset.

3.1 Source Data

Jurisdictions are encouraged to work collaboratively to determine the best starting point for developing a seamless boundary. The table below lists two data sources available for use as a foundation. Jurisdictions with already refined PSAP boundaries also may choose to begin there. Once a baseline dataset is selected, the geographic information system (GIS) staff can begin editing the linework to address any errors or inaccuracies.

Table 1: Data Sources

Source	Description	Link
PSC GIS Line File	Developed specifically for this project from the NE State hosted county boundary file. Exploded polygon, broken at each jurisdictional boundary.	
U.S. Census County Boundary	1:500,000 resolution. Census TIGER File dataset	LINK

3.2 Collaboration Tools

Jurisdictions may choose to deploy a collaboration space on ArcGIS Online (AGOL) to support this effort. The AGOL portal allows each jurisdiction to upload a PSAP boundary line file editable by both jurisdictions. Supporting datasets from the State data catalog also can be added. While this tool does enable remote editing of the data, the standard best practice for resolving PSAP boundaries requires the PSAP leadership and GIS staff from both jurisdictions to be in the same room. Boundary drawing decisions depend on operational considerations such as mutual-aid response, first-due responsibilities and water-rescue capabilities, and thus are more readily reached in a focused, face-to-face meeting.

4 Editing Process

The collaboration between two jurisdictions to resolve PSAP boundaries will take multiple sessions. GIS staff are not responsible for redefining PSAP boundaries beyond the jurisdictional boundary. However, the PSAP boundary between two jurisdictions can, and should, be resolved to the jurisdictional boundary before involving the PSAP leadership.

Once a source dataset has been selected, GIS staff must insert the NG911-required fields into the attribute table. The table below is the National Emergency Number Association (NENA) NG911 GIS Data Model schema for PSAP boundaries.

Table 2: NENA GIS Schema: PSAP Boundary

Descriptive Name	Field Name	M/C/O	Type	Field Width
Discrepancy Agency ID	DiscrpAgID	M	P	75
Date Updated	DateUpdate	M	D	-
Effective Date	Effective	O	D	-
Expiration Date	Expire	O	D	-
Emergency Service Boundary NENA Globally Unique ID	ES_NGUID	M	P	254
State	State	M	P	2
Agency ID	Agency_ID	M	P	100
Service URI	ServiceURI	M	U	254
Service URN	ServiceURN	M	P	50
Service Number	ServiceNum	O	P	15
Agency vCard URI	AVcard_URI	M	U	254
Display Name	DsplayName	M	P	60

4.1 PSAP-to-Jurisdiction Boundary Resolution

GIS staff can begin the boundary resolution process by removing any overlaps or gaps in the boundary files between the two jurisdictions. If the source data used is void of any such errors, this process simply will require GIS staff to validate the dataset’s topological and geographic quality. Boundary files may have been created decades ago, and therefore may require updating along stream beds, road centerlines, and other landmarks used in the original creation that have changed over time.

4.1.1 Property Lines

The jurisdictional boundaries may bisect property or building footprints. GIS staff, in collaboration with PSAP leadership, should decide before the initial editing session whether the PSAP boundary will be edited to follow property lines or adjusted to avoid bisecting buildings or campuses with a single point of ingress.

4.1.2 Water Features

Nebraska contains jurisdictional boundaries which were drawn around hydrographic features. Because water will dramatically redefine the landscape over several centuries, jurisdictions sharing boundaries based on water features must revisit the landscape through the use of orthoimagery provided by the State.¹

¹ <http://www.nebraskamap.gov/search?tags=imageryBaseMapsEarthCover>

4.2 PSAP-to-PSAP Boundary Resolution

In the 911-call-to-response process, every second counts toward realizing a positive outcome. The end goal for adjusting the PSAP boundary away from the jurisdiction boundary is to minimize call transfers, which delay the delivery of emergency services.

Once the individual jurisdictions' PSAP boundary files are created and resolved between the two jurisdictions, the process now relies on the expertise of the PSAP directors in each jurisdiction to adjust the boundaries based on historical call-processing challenges. This is best accomplished in person, with each jurisdiction's GIS expert editing the data. To expedite the process, a group of jurisdictions sharing common boundaries can meet en masse to resolve multiple boundaries simultaneously.

5 Boundary Maintenance

Boundaries should be revisited when development occurs along the boundaries. As with all border geometry, every time edits to a PSAP boundary are necessary, these edits must be coordinated with the neighboring jurisdiction(s). Likewise, edits to the PSAP boundary file must be made available to the State and to all Emergency Services Internet Protocol Network (ESInet) and spatial interface (SI) providers in the state.