Idaho Technology Authority (ITA)

ENTERPRISE STANDARDS – S4000 – INFORMATION AND DATA

Category: S4273 – Emergency Service Boundaries

CONTENTS:

I. DEFINITIONS

See ITA Guideline G105 (ITA Glossary of Terms) for definitions.

II. RATIONALE

Data standards are essential for development of statewide geospatial datasets (Framework), in accordance with The Idaho Map vision and plans. More specifically, statewide emergency service zones are required to support Next Generation 911.

The Emergency Service Boundaries standard described in this document are similar, but different from the ITA S4230 – Framework Standard for Emergency Service Zones Standard. Specifically, Emergency Service Zones are used in an E9-1-1 environment, and Emergency Service Boundaries are used in NG-911. It is anticipated that as the whole State converts to NG-911 that at some point S4230 will be phased out.

III. APPROVED STANDARD(S)

See Attachment.

IV. APPROVED PRODUCTS

All GIS software used in Idaho are capable of generating and using the specified file format.

V. JUSTIFICATION

Evolving public safety needs, among others, require statewide authoritative spatial data to fuel applications.

VI. TECHNICAL AND IMPLEMENTATION CONSIDERATIONS

This standard requires a minimum of information in order to share and integrate emergency service zone data. Very few jurisdictions will have difficulty implementing the standard if they have any GIS capability. Some support will be available through the state partner managing this Framework element.

VII. EMERGING TRENDS AND ARCHITECTURAL DIRECTIONS

Traditional implementation of 911 capability is changing significantly from equipment intensive and telephone provider reliance to Internet-based telecommunications and spatial data. This new approach, which is much less expensive for counties to implement and maintain, requires spatial data. NG9-1-1 requires statewide spatial data.

VIII. PROCEDURE REFERENCE

The format and content of this standard is specified in ITA P5030 – Framework Standards Development Policy.

IX. REVIEW CYCLE

Review will occur at least annually.

X. CONTACT INFORMATION

For more information, contact the ITA Staff at (208) 605-4064.

XI. REVISION HISTORY

12/02/2022 - Section 3 Data Characteristics revised

09/15/2022 - Standard approved by the IGC-EC

08/24/2022 - Draft standard approved by the Idaho Public Safety Technical Working Group

Effective date: September 15, 2022

STATE OF IDAHO

Idaho Emergency Service Boundaries Standard

Part of the Public Safety Theme

Version 1
Effective September 15, 2022

Developed by the Public Safety Technical Working Group

Revision History
Established by Public Safety Technical Working Group

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CONTENTS

1. Introduction to the Emergency Service Boundary Standard

A statewide Emergency Service Boundary (ESB) Framework Dataset is a critical source of information that is used by the Emergency Call Routing Function (ECRF) of the Next Generation 9-1-1 system (NG9-1-1) to determine which primary responders, including Law Enforcement, Fire and Emergency Medical Services a 9-1-1 call should be routed to.

The ESB Standard is intended to facilitate integration and sharing of up-to-date ESB data and enhance the dissemination and use ESB information. This standard does not instruct on how ESB databases should be designed for internal use.

This standard was developed by the Public Safety Technical Working Group, a subgroup of the Idaho Geospatial Council – Executive Committee (IGC-EC). This Standard will be reviewed on a regular basis and updated as needed.

This Framework data standard requires that separate polygons are created for each service type. For example, even if a Fire and Law Enforcement boundary are the same, they should be show in their own, separate, polygons.

1.1. Mission and Goals of the Standard

The ESB Standard supports a statewide dataset that is consistent with applicable state and national standards. It establishes the minimum attributes and geospatial database schema for the ESB Framework. The standard will communicate with and may have similar attributes to other Idaho Framework data standards. It encourages all Idaho-based agencies with geospatial ESB data to contribute to the ESB Framework.

The ESB Framework will be appropriately shared and beneficial to all. The fields in the ESB Data Exchange Standard will be general enough to incorporate basic information without requiring major changes to internal data models. This standard allows for expansion to a more complex data structure and schema.

The ESB Standard must support the NG9-1-1 systems implementation and operation in Idaho and is therefore closely aligned with the 2020 National Emergency Number Association Standard (NENA-STA-006.1.1-2020).

The proposed standard:

- Provides the data needed to determine the correct emergency responding areas.
- Promotes the creation of high-quality GIS data in a consistent format for use within

NG9-1-1 systems.

1.2. **Relationship to Existing Standards**

This NG9-1-1 Public Safety Standard relates to existing standards as follows:

- The ESB Standard described is based on the 2020 National Emergency Number Association Standard (NENA-STA-006.1.1-2020).
- The ESB boundaries are related to GIS datasets describing County and City Boundaries as well as taxing district boundaries representing ambulance, fire, and hospital.
- This ESB Standard relates to the Public Safety Answering Point (PSAP) and Provisioning Boundary standards developed by the Idaho Public Safety Technical Working Group.

1.3. **Description of the Standard**

This standard describes the vision and geospatial data structure of a ESB Framework in the state of Idaho. This standard is devised to be:

- Simple, easy to understand, and logical
- Uniformly applicable, whenever possible
- Flexible and capable of accommodating future expansions
- Dynamic in terms of continuous review
- Consistent with the requirements of NG9-1-1 systems and implementation

1.4. **Applicability and Intended Uses**

This standard applies to the ESB element of the Public Safety theme of The Idaho Map (TIM).

When implemented, it will enable access to geometry and attribute information about Idaho ESBs. It will increase interoperability between automated geographic information systems and enable sharing and efficient transfer of information for aggregation. Further, it will encourage partnerships between government, the private sector, and the public in order to avoid duplication of effort and ensure effective management of information resources. It will help improve ESB data quality as errors are identified and resolved.

This standard does not consider data sharing agreements, contracts, transactions, privacy concerns, or any other issues relating to the acquisition and dissemination of ESB data.

1.5. **Standard Development Process**

The Public Safety Technical Workgroup (TWG), a subgroup of the Idaho Geospatial Council Executive Committee (IGC-EC), is a voluntary group of private, city, county, tribal, state, and federal representatives. In 2021, the Public Safety TWG reviewed the NENA Standard and ESB standards implemented in Kansas, Tennessee, Minnesota, and Wisconsin to begin developing the ESB Standard described in this document. The first draft was generated using the standard development automation tools developed by the IGC-EC. This standard was then reviewed by members of the Public Safety TWG. The resulting draft was further shared with the IGC-EC for comments and approval in accordance with the review and approval process described in Idaho Technology Authority (ITA) P5030 - Framework Standards Development Policy.

The standard was presented to the IGC-EC in September 2022 and approved by the IGC-EC on September 15, 2022.

1.6. **Maintenance of the Standard**

This standard will be revised as needed and in accordance with the ITA P5030 - Framework Standards Development Policy.

2. **Body of the Standard**

2.1. **Scope and Content**

The scope of the ESB Standard is to describe a statewide layer which identifies the Emergency Service Boundaries (ESBs) in Idaho for service agencies such as, Fire, Medical Emergency, Law Enforcement that should be called upon during an NG9-1-1 call.

At a minimum the ESB Framework Dataset should include Law Enforcement, Fire and Emergency Medical Services boundaries. The ESB may also include other service areas such as those for Poison Control, Forest Service and Animal Control.

2.2. **Need**

ESBs are a key dataset needed for emergency response in Idaho. They are used by the Emergency Call Routing Function (ECRF) of NG9-1-1 systems to determine to which Fire, Law Enforcement, Medical Emergency, or other service provider a NG9-1-1 call should be routed. The standard will help streamline emergency response, thereby benefitting public emergency responders, cities, counties, system service providers, and the public in general. This standard provides a foundation for data stewardship and aggregation of ESB data for centralized access.

2.3. **Participation in the Standard Development**

The development of the ESB Standard adheres to the ITA's Framework Standards Development Policy (P5030). The Public Safety TWG members tasked with developing this standard represent private, county, state, and federal organizations. As the standard is reviewed in accordance with Policy P5030 requirements, there will be opportunity for broad participation and input by stakeholders. The process will be equally broad regarding input on updates and enhancements to the standard. As with all Idaho Framework standards, public review, and comment on the ESB Data Exchange Standard is encouraged.

2.4. **Integration with Other Standards**

The ESB Standard follows the same format as other Idaho geospatial framework data standards as well as NENA Standards. The ESB Standard may contain some of the same attributes as other framework standards and may adopt the field name, definition, and domain from other standards to promote consistency and strengthen interoperability.

2.5. **Technical and Operation Context**

2.5.1. **Data Environment**

The data environment is a digital vector polygon with a specific, standardized set of attributes pertinent to the ESB Framework. ESB data shared under this standard must be in a format supporting vector polygons.

2.5.2. **Reference Systems**

The Emergency Call Routing Function in a NG9-1-1 system requiring the use of the World Geodetic System of 1984 (WGS1984). The number assigned to this reference system by the European Petroleum Survey Group (EPSG) is 4326.

2.5.3. **Global Positioning Systems (GPS)**

Some data provided might contain geometry from GPS methods. The provided metadata should describe the geometry, if applicable. However, geometry from a GPS is not required to meet this standard.

2.5.4. **Interdependence of Themes**

ESB geometry may be coincident with other framework data, such as City limits, County Boundaries, Ambulance, Fire and Hospital taxing districts, Public Safety Answering Zones, as well as Roads and Parcels. Currently, there is no enforcement of coincidence or topology relationships between ESB Framework and other Idaho Framework elements.

2.5.5. **Encoding**

When data is imported into and exported from the ESB Framework, encoding will take place to convert data formats and attributes.

2.5.6. **Resolution**

No specific requirements for resolution are specified in this standard. Resolution will be documented in the metadata.

2.5.7. **Accuracy**

The horizontal accuracy of GIS layers used for NG9-1-1 must meet the National Spatial Data Infrastructure's (NSDI) accuracy at a scale of 1:5000 which equates to ± 13.89 feet at 95% confidence.

2.5.8. **Edge Matching**

Boundary synchronization issues must be resolved using road centerlines, address points, or snap-to-point datasets. Clean ESB edges will ensure that GIS street centerlines and/or address points will be accurately associated with a ESB's area of responsibility. Edges must be agreed upon by adjacent agencies that are provisioning the ESB data.

2.5.9. **Unique Identifiers**

The Discrepancy Agency is the entity responsible for resolving discrepancies in the ESB data or topology. This entity must be defined by the 9-1-1 Authority and uniquely identified within the ESB framework. The Emergency Service Boundary NENA Globally Unique ID is unique for all of the United States.

2.5.10. **Attributes**

Attributes for public and intergovernmental distribution are described in Section 3 of this standard.

2.5.11. **Stewardship**

Perpetual maintenance and other aspects of lifecycle management are essential to ESB Framework. Details of stewards, their roles and responsibilities, and processes are not included in this document and may be specified in a separate related documents.

2.5.12. **Records Management and Archiving**

This dataset is managed at different levels. Data is developed and edited by GIS Data Providers of City and County governments, aggregated at the State Level and distributed via secured REST services using ArcGIS Enterprise. Tools related to REST Services, such as Open Data, will allow users to download ESB data in a variety of formats, including a shapefile and a feature class in a file geodatabase.

2.5.13. **Metadata**

The ESB Framework metadata will describe the methods used to update and aggregate the individual ESB data contributions, processes or crosswalks performed, definition of

attributes, and other required information. This metadata will conform to the metadata standards as set out in S4220 – GEOSPATIAL METADATA.

3. **Data Characteristics**

The “Field Name” column gives the standardized GIS data field name that MUST be used. While local entities MAY use their own field names for internal processes, utilization of GIS data within and between the NG9-1-1 system functional elements MUST conform to this standard structure.

The “Required” column specifies whether an attribute is required or conditional. Requirement terms are defined as follows (NENA 01-002):

- "Yes" means the data element is required to be present in all records. It will appear as required in the database schema.
- "No" means that the data field is optional in a record. It will not appear as required in the database schema.
- "Conditional" means that the data field is conditional. This value alerts the reader that a business rule is specified that controls the presence of a value in the data field. It will not appear as required in the database schema. The prevailing business rule for all conditional attributes is that if an attribute value exists (e.g., if a Street Name Pre Directional such as “West” is part of the valid street name), it MUST be provided. If no value exists for the attribute (e.g., there is no Street Name Pre Directional as part of the valid street name), the data field is left unpopulated. All attributes that are governed by CLDXF PIDF-LO structure MUST follow the business rules identified in the CLDXF Standard, NENA-STA-004 [3],CLDXF . If no business rule is identified, the prevailing rule will apply.

Locally maintained GIS data layers are REQUIRED to include all data fields specified as "Yes" within this GIS Data Model but are NOT REQUIRED to include data fields that are not specified as "Yes" if no data exists to be populated within the data fields. If there are no records in the entire database for a specific non-required data field, then the data field itself is NOT REQUIRED. Local policy may dictate that all data fields be included in the structure regardless of whether data exists.

“Type” column indicates the type of data used within the data field and attributes.

- **P** – Printable ASCII characters (decimal codes 32 to 126). Case is not important, except in legacy fields which require upper case as per NENA 02-010, NENA Standard for Data Formats for 9-1-1 Data Exchange & GIS Mapping
- **E** – UTF-8 restricted to character sets designated by the 9-1-1 Authority, but not including pictographic characters.

- **U** – A Uniform Resource Identifier (URI)
- **D** – Date and Time
- **F** – Floating (numbers that have a decimal place).
- **N** – Non-negative integer

The "Field Width" column refers to the maximum number of characters a field may contain.

The "Descriptive Name" is provided to clarify the intent of the information contained in the "Field Name."

- **DOM** - Domain. Attributes with domains are noted in the "Descriptive Name" column. Domain names and their values will be identified in a Public Safety GIS best practices document.

3.1. **Minimum Graphic Data Elements**

The geometry of the features in ESB Framework is vector polygon.

3.2. **Optional Graphic Data Elements**

Not applicable.

3.3. **Standard Attribute Schema**

FIELD NAME	REQUIRED	TYPE	FIELD WIDTH	DESCRIPTION
DiscrpAgID	Yes	P	100	Discrepancy Agency ID - Agency that receives discrepancy report and ensures resolution.
DateUpdate	Yes	D	-	Date Updated - The date and time that the record was created or last modified. This value MUST be populated upon modifications to attributes, geometry, or both.
DateEffective	No	D	-	Effective Date - The date and time that the record is scheduled to take effect.
DateExpire	No	D	-	Expiration Date - The date and time when the information in the record is no longer considered valid.

ESB_NGUID[1]	Yes	Text	254	The NENA Globally Unique ID for each Emergency Service Polygon. Each record in the Emergency Service Polygonlayer MUST have a globally unique ID. When coalescing data from other local 9-1-1 Authorities into the ECRF and LVF, this unique ID MUST continue to have only one occurrence. One way to accomplish this is to append the 9-1-1 Authority's domain to the end of the "locally unique ID"
Country	No	P	2	Country DOM
State	No	P	2	State or Equivalent (A1) DOM
Agency_ID	Yes	P	100	County or Equivalent (A2) DOM
ServiceURI	Yes	U	254	The URI* for call routing is usually a Session Initiation Protocol (e.g., SIP or SIPs) URI that defines the route to reach the service.
ServiceURN	Yes	P	50	The URN used to select the service for which a route is desired. The ECRF is queried with a location and a Service URN that returns the Service URI*.
ServiceNum	No	P	15	The numbers that would be dialed on a 12-digit keypad to reach the service appropriate for the location. The phone number for associated service boundary for service polygons: PolicePoly, FirePoly, EmsPoly, PoisonControlPoly, etc.
AVcard_URI	Yes	U	254	A vCard is a file format standard for electronic business cards. The Agency vCard URI* is the internet address of JavaScript Object Notation (JSON) data structure which contains contact information (Name of Agency, Contact phone numbers, etc.) in the form of a jCard (RFC 7095).
DsPlayName	Yes	P	60	A description or "name" of the service provider that offers services within the area of a Service Boundary. This value MUST be suitable for display

[1]If the Emergency Services Boundary layer is split out into different datasets for fire, ambulance, police, etc. Use the following Field Names:

- Fire – Fire_NGUID
- Ambulance – EMS_NGUID
- Police – Pol_NGUID

3.4 **Data Schema (Supplemental Attributes)**

These attributes are recommended for Idaho datasets, but are not a part of the NENA standards and are considered supplemental. The additional attributes may meet local or regional requirements for internal workflows or other 911 mapping systems.

FIELD NAME	REQUIRED	TYPE	FIELD WIDTH	DESCRIPTION
GIS_Steward	No	P	75	GIS Steward for data set maintenance DOM
LocalID	No	N	40	An identifier used for tracking Emergency Service Boundaries in the local dataset
UpdatedBy	No	P	50	Person that last updated the record
ESN	No	P	5	The Emergency Service Number assigned to an emergency service area representing Law, Fire, Ems response for a particular polygon for traditional enhanced 911 services.
Submit	No	P	1	Y – Emergency Service Boundary should be included in the statewide dataset. N – Emergency Service Boundary should not be included in the statewide dataset. DOM
Comments	No	P	255	Notes about the feature. Used for communication between the local data maintainer and the aggregator. Will NOT appear in state data layer

** A URI is an identifier consisting of a sequence of characters matching the syntax rule that is named in RFC 3986 (T. Berners-Lee et al) The characters allowed are from a very limited set: the letters of the basic Latin alphabet, digits, and a few special characters. It enables uniform identification of resources via a set of naming schemes. A URI can be further classified as a locator, a name, or both. The term "Uniform Resource Locator" (URL) refers to the subset of URIs that, in addition to identifying a resource, provides a means of locating the resource by describing its primary access mechanism (e.g., its network "location"). An Example of a URI is sips:sos.ESB@eoc.houston.tx.us or tel:+12025551212.*

3.5 **Data Quality**

Data quality considerations for ESBs include:

- All ESB, Emergency Service Boundary, and NENA Global IDs need to be unique in all of Idaho.
- All attributes listed in section 3.3. are mandatory with the exception of Effective Date, Expiration Date, Service Number and Notes

Because GIS data provisioned for use in NG9-1-1 system is used in live-or-death situations, quality standards are typically higher than for other datasets and the data should be rigorously validated to for correct names, database integrity, topology issues and correct edge matching.

Appendix A: References

Idaho Technology Authority (ITA). *Information and Data Policy P5000, Category: P5030 Framework Standards Development Policy.* https://ita.idaho.gov/psg/p5030.pdf

Idaho Technology Authority (ITA). *Enterprise Standards S4000 Geographic Information Systems (GIS) Data, Category: S4220 Geospatial Metadata.* https://ita.idaho.gov/psg/s4220.pdf

Federal Communications Commission (FCC).*911 Master ESB Registry.* 911 Master ESB Registry | Federal Communications Commission (fcc.gov)

National Emergency Number Association (NENA) Data Structures Committee, NG9-1-1 GIS Data Model Working Group. *NENA standards for NG9-1-1 GIS Data Model.* NENA-STA-006.2-20222. NENA NG911 GIS Data Model

Kansas 911 Coordinating Council. *Kansas NG9-1-1 GIS Data Model V2.0* Kansas NG9-1-1 GIS Data Model (kansas911.org)

T. Berners-Lee, R. Fielding, L. Masinter, Internet Engineering Task Force, *Uniform Resource Identifier (URI) Generic Syntax*, RFC 3986. Exhibit X.

Appendix B: Glossary

See ITA Guideline G105 (ITA Glossary of Terms) for definitions.