State of Idaho
NG9-1-1
Geographic Information System Recommendations Report

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Revised

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Table of Contents

1. Introduction

This Geographic Information System Recommendations Report (GIS Report or Report) is produced as a companion document to the State of Idaho Enhanced/Next Generation 9-1-1 Plan Update (NG9-1-1 Plan). As such, it incorporates Plan components by reference and may require modification when the NG9-1-1 Plan is updated.

The NG9-1-1 Plan addresses Geographic Information Systems (GIS) as follows:

GIS data plays a critical role in the successful implementation and operation of an i3 NG9-1-1 geospatial routing solution. NENA[1] i3 guidelines and processes focus on the use of GIS data to support the Location Validation Function (LVF) and ECRF[2] critical to emergency call processing within the NG9-1-1 environment. GIS data has been traditionally maintained and utilized by local 9-1-1 authority agencies primarily as a means of reference within their 9-1-1 map display and address/master street address guide (MSAG) management applications. With the advent of NG9-1-1, GIS now represents a core function within the overall NG9-1-1 solution. Critical to this core function is the accuracy and integrity of GIS data because it is aggregated and maintained for use within the NG9-1-1 GIS routing solution.

The implementation of NG9-1-1 in Idaho will require ECCs to share resources in areas that involve cross jurisdictional boundaries (international, federal, state, tribal, etc.). The IPSCC[3] will develop mutually supportive NG9-1-1 policies and procedures where sub-regions or jurisdictions maintain relationships with their stakeholders.

As Idaho implements NG9-1-1, all local jurisdictional GIS data must be uploaded to the LVF/ECRF and a method for how geospatial layers/files are uploaded to the databases will be established. The GIS data that is uploaded ultimately determines if a location is valid for 9-1-1 routing, and results in the proper routing of the call to the correct ECC for handling. Therefore, the State is required to assess the architecture, standards, and workflow requirements necessary for GIS data to be aggregated and provisioned for NG9-1-1. GIS requirements must be implemented prior to the implementation of geospatial routing throughout the State. The capabilities of GIS at the state and local level in support of the desired NG9-1-1 deployment include compliancy of the entire GIS routing solution to include the options between local and state-level routing.

[1] National Emergency Number Association (NENA)
[2] Emergency Call Routing Function (ECRF)
[3] Idaho Public Safety Communications Commission (IPSCC)

This GIS Recommendations Report addresses the development of supportive NG9-1-1 policies and procedures around the standards, and workflow requirements necessary for GIS data to be aggregated and provisioned for NG9-1-1.

2. GIS and NG9-1-1

An essential element of NG9-1-1 is geospatial call routing via the Emergency Call Routing Function (ECRF) Core Service. Today's NG9-1-1 applications and solutions are becoming more reliant on complete and highly accurate geospatial data housed and maintained in Geographic Information Systems (GIS). NG9-1-1 call routing solutions, in today's world, rely on the provisioning of localized geographical data and polygon areas, built and maintained through GIS systems, to accurately route emergency calls to the appropriate, responsible Emergency Communications Center (ECC) at a state, region, or local level. In addition, NG9-1-1 GIS technology provides for improved caller location that shortens call processing times and the response times of emergency services.

The GIS / mapping data should be provisioned at the local level and provided by the local jurisdiction. It should be the sole source of geospatial data utilized. Having a sole source of GIS data provides consistency and accuracy of the operational picture across the entire Public Safety spectrum. While many state, local and regional entities maintain GIS data, the data is typically centered around parcels, transportation, planning and zoning issues, and not necessarily focused on Public Safety. It should also be noted that a significant number of county GIS operations are in name only, often manned by an individual with other primary duties and responsibilities other than GIS data creation and maintenance.

The Idaho State Police (ISP) also maintains GIS data with a focus on Public Safety, based on the needs of the ISP.

The NG9-1-1 system being contemplated by the State of Idaho will use a dynamic GIS to make ECRF and LVF decisions. Not only will any planned NG9-1-1 system need this data, but local, regional and statewide Public Safety GIS datasets will be of immense value to virtually all aspects of Public Safety in Idaho. This GIS map data will eventually replace the traditional Master Street Address Guide (MSAG) databases as the primary database for location-based call routing and location validation ECRF/LVF functions within the NG9-1-1 system being planned.

To enable geolocation services and geospatial routing through a fully functional ECRF/LVF, it will be necessary for the State and local ECC jurisdictions to begin working towards reconciling the legacy location validation and routing databases (MSAG/ALI) to the GIS-based database and have in place a process to coordinate timely updates to future aggregated GIS dataset(s).

As the State continues to plan for NG9-1-1 it will be imperative that local ECC jurisdictions continue to routinely update and maintain the synchronization of their GIS, MSAG and ALI data. Local ECC jurisdictions must recognize the fact that the on-going process of assessment, improvement and maintenance of their GIS data will benefit both their current 9-1-1 systems, but additionally help prepare them for the future migration to NG9-1-1.

3. GIS Spatial Data Implementation

To continue the evolution and transition to a fully functional NG9-1-1 solution, the State and ECC community should progress through a logical process of steps, ending in a regionalized or statewide aggregated, GIS spatial dataset. There are essentially five primary steps the State should work through in reaching the end goal of establishing and maintaining fully compliant and functional GIS data for provisioning into a fully functioning ECRF/LVF call-routing system.

1. Establish Idaho NG9-1-1 GIS Standards and Best Practices
2. GIS Stakeholder Education, Outreach, and Training
3. GIS data GAP analysis
4. Aggregation of regionalized or statewide GIS spatial dataset(s)
5. Regular maintenance and updates to critical GIS spatial datasets

3.1 Establish NG9-1-1 GIS Standards and Best Practices

NENA specializes in setting standards focused around the creation, implementation, and management of GIS data for NG9-1-1 systems. Specifically, the NENA Standard for NG9-1-1 GIS Data Model provides the foundation for the establishment of any state or regional level Best Practices document.

It is imperative the State and local ECC stakeholders begin working together in coordinating the development of an Idaho NG9-1-1 GIS Standards and Best Practices guideline based on the NENA Standard for NG9-1-1 GIS Data Model.

These standards and best practices should also establish and address ongoing maintenance and quality control policies and procedures related to maintaining, updating and constant improvements to the NG9-1-1 GIS data.

3.2 GIS Stakeholder Education, Outreach, and Training

Once the State has established a set of NG9-1-1 GIS Standards and Best Practices, it is beneficial to follow-on with an educational component to ensure all stakeholders are well-versed on the standards and their importance in transitioning to NG9-1-1 ready GIS data.

Successful educational programs incorporate multiple ways to reach the greatest number of stakeholders as efficiently and effectively as possible. Utilizing in-person sessions and

webinars (live or recorded) through established groups and events has proven highly successful.

3.3 GIS Data GAP Analysis

Best practice policy calls for the synchronization and standardization of GIS road centerlines, site/structure address points, and other associated data with MSAG and ALI data. Described in NENA 71-501[4] are guidelines and procedures to synchronizing the MSAG and ALI databases to the GIS road centerline and site/structure address points. This synchronization process not only improves the accuracy of the locally sourced GIS, MSAG and ALI data, but also aids in the preparation and accuracy of the data for NG9-1-1.

Performing this GAP analysis assessment provides a valuable baseline of the relative accuracy of the GIS data at the ECC or County level throughout the State required for fully functional NG9-1-1 call routing.

3.4 GIS Data Aggregation

A NG9-1-1 system containing a fully functional LVF/ECRF call routing service is dependent on an accurate GIS dataset as its backbone. This “seamless” dataset should be an aggregation of GIS data sourced and maintained at the local authoritative level. Typically, the aggregation of data is at the state level as a single seamless statewide dataset. However, aggregated datasets may be developed on a regional basis, such as a DIGB[5], COG[6], or similar entity.

Whether the aggregation is statewide or tiered regionally, the process will require close cooperation and coordination between the local entities and regional partnerships to ensure the data aggregation is consistent and thorough throughout. Developing the initial Idaho NG9-1-1 GIS Standards and Best Practice policies; creating and deploying a comprehensive education, outreach and training program; and facilitating the baseline GIS GAP analysis effort, will set the stage for the successful aggregation of the GIS data components required for NG9-1-1 call routing functionality.

[4] https://www.nena.org/page/synch_gis_msag_ali
[5] District Interoperability Governance Board (DIGB)
[6] Council of Governments (COG)

3.5 Regular Maintenance and Updates

The aggregated GIS data will be a core component of the NG9-1-1 system used to validate address data and route 9-1-1 calls to the correct ECC. Critically important will be the maintenance and upkeep of this seamless statewide GIS dataset.

The GIS data representing address information (road centerlines, address points) and service area boundaries (PSAP[7] and Emergency Services boundaries) will need to be accurate, up-to-date, and seamless across the entire state. The importance of data quality (accuracy, consistency, timeliness, completeness) cannot be overstated. Sustainable data maintenance standards, processes and workflows are vital and should not be overlooked when developing the NG9-1-1 system.

Local entities will continue to maintain their own GIS data and will submit their data to the State (i.e. Idaho Geospatial Office) or third-party vendor.

Local entities will upload their data via a managed service process at the State level utilizing the State's established NG9-1-1 GIS standardized schema. Through this service, the State or third-party vendor would assist in reporting any data discrepancies identified when passing the data through validation steps prior to acceptance into the primary statewide dataset.

The local agencies would then be responsible for the remediation of any identified errors, discrepancies, or data validity issues.

It is imperative that the State and local entities clearly understand the critical nature and use of GIS data in a NG9-1-1 environment and begin identifying the resources required to meet the data creation and maintenance requirements involved.

[7] NENA still references some legacy terminology within several of their Standards, Informational and Best Practices documents. Public Safety Answering Point (PSAP) is referred to as emergency communications center (ECC) throughout this document and future legislation.

4. NG9-1-1 Standards and Best Practices

The National Emergency Number Association (NENA) is recognized as the standards-making body for NG9-1-1 developing both standards and information documents. A thorough comparison of the current NG9-1-1 standards germane to the implementation of NG9-1-1 GIS has recently been completed. Most of these NG9-1-1 standards and information documents below are being shepherded by the NENA Working Groups[8] and in some cases in collaboration with the Association of Public-Safety Communications Officials (APCO) International Standards Development Committee (SDC).[9]

Since the NG9-1-1 world remains in a constant state of change, it must therefore be assumed that current standards pertaining to the new 9-1-1 technology will also be evolving, and that the requirement to publish updated standards will be ongoing.

4.1 Standards

NENA Standard for NG9-1-1 GIS Data Model

NENA-STA-006.1-2018 - NENA Standard for NG9-1-1 GIS Data Model - This document defines the Geographic Information Systems (GIS) Data Model, which supports the NENA Next Generation 9-1-1 (NG9-1-1) Core Services (NGCS) of location validation and routing, both geospatial call routing or to the appropriate agency for dispatch. This model also defines several GIS data layers used in local (ECCs) and response agency mapping applications for handling and responding to 9-1-1 calls.

https://www.nena.org/page/NG911GISDataModel

Supplemental NENA GIS Informational Documents

NENA-STA-004.1.1-2014 - NENA Next Generation 9-1-1 (NG9-1-1) United States Civic Location Data Exchange Format (CLDXF) Standard - This document defines the civic location data elements used to support the NENA compliant Next Generation systems, databases, call routing, call handling, and related processes. The CLDXF document was developed to:

[8] https://www.nena.org/page/NDGCommitteeList;
[9] https://www.apcointl.org/standards/

1. Provide a definitive set of core civic location data elements that support emergency call routing and dispatch.

2. Map a profile between Presence Information Data Format-Location Object (PIDF-LO) and those same NENA core civic location data elements.

3. Map those civic location data elements to the corresponding Federal Geographic Data Committee, United States Thoroughfare, Landmark, and Postal Address Data Standard, Document Number FGDC-STD-016-2011 set of data elements, which was sponsored by the Urban and Regional Information Systems Association (URISA) and the National Emergency Number Association (NENA).

4. Provide illustrative examples of address parsing.

https://www.nena.org/page/NG911CLDXF

NENA-STA-010.2-2016 (originally 08-003) - NENA Detailed Functional and Interface Standards for the NENA i3 Solution (update in progress) - This specification builds upon prior NENA publications including i3 requirements and architecture documents. Familiarity with the concepts, terminology and functional elements described in these documents is a prerequisite. While the requirements and architecture documents describe high level concepts, the present document describes only the detailed functional and external interfaces to those functional elements. If there are discrepancies between the requirements or architecture documents and this document, this document takes precedence. This document provides a baseline to other NG9-1-1 related specifications.

https://www.nena.org/page/i3_Stage3

NENA-REQ-002.1-2016 - NENA Next Generation 9-1-1 Data Management Requirements - This document defines discrepancy report and the performance reports associated with processes within the Next Generation 9-1-1 (NG9-1-1) system. The intent of the document is to provide 9-1-1 Authorities, vendors, Communication Service Providers (CSP), and other interested parties with guidelines for communicating issues or status of various elements within the system. The components of the document are Discrepancy Report Requirements and Performance Statistic Report Requirements.

https://www.nena.org/page/NGDataMgmt

NENA-STA-005.1.1-2017 - NENA Standards for the Provisioning and Maintenance of GIS data to ECRF and LVFs - This document defines operational processes and procedures necessary to support the i3 Emergency Call Routing Function (ECRF) and Location Validation Function (LVF). Additionally, this document identifies ECRF/LVF performance and implementation considerations for 9-1-1 Authorities' consideration.

https://www.nena.org/page/ProvGISECRFLVF

NENA-INF-028.1-2020 - NENA Information Document for GIS Data Stewardship for Next Generation 9-1-1 - The purpose of this document is to support the development of complete, accurate and current GIS datasets to be used within NG9-1-1 systems. These datasets will be used to validate call location information, to route calls to the correct responding agency, and to display locations in context for call handling purposes. Following the recommendations presented will result in more accurate, efficient and reliable operation of GIS data dependent services within NG9-1-1 Systems.

https://www.nena.org/page/GISDataStewardship

4.2 Best Practices

NENA-INF-014.1-2015 - NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1 - This document is an informational tool chest, not a listing of instructions and requirements. The reader will find a great deal of practical information on address point placement methodologies, based on real world experience. Reading the entire document will provide the greatest understanding of address point placement options and be the most beneficial to the reader.

https://www.nena.org/page/SSAP

NENA-INF-71-501 - NENA Information Document for Synchronizing GIS with MSAG & ALI - This document is meant to provide ECC management, vendors, and other interested parties necessary guidelines for synchronizing GIS data with existing 9-1-1 databases. The synchronization process of the GIS data is most reliably accomplished by qualified, trained individuals or vendors that have received formal GIS training and instruction.

https://www.nena.org/page/synch_gis_msag_ali

NENA-INF-027.1-2018 - NENA Information Document for Location Validation Function Consistency - This document provides recommendations that Location

Validation Function (LVF) stakeholders, including operators, implementers, Geographic Information System (GIS) personnel and LVF clients can follow to help ensure that when LVFs from different vendors are provisioned with the same GIS data, they return consistent location validation responses for the same civic locations.

https://www.nena.org/page/LVFconstncy

5. NG9-1-1 GIS Data Features

The following GIS data feature layers identified in this section are those utilized for the provisioning of the LVF and ECRF. Following and adhering to NENA standards (NG9-1-1 GIS Data Model[10]) provides for the consistency of data development and maintenance across the entire state and ensures the ability to route 9-1-1 calls based on location. This adherence ensures the ability to share GIS data and information throughout the State, regions and adjoining states as NG9-1-1 evolves.

The data layers listed below are sub-divided into three categories:

1. **Required Layers** – These layers represent the minimum data required to provision the LVF and ECRF functions essential to call taking, call routing and dispatch operations.

2. **Strongly Recommended Layers** – These layers aid in the functionality of the LVF and ECRF and are strongly recommended and serve to provide additional location validation accuracy.

3. **Recommended Layers** – These layers represent the remaining minimum recommended GIS data for NG9-1-1 call taking and dispatch operations.

4. **Additional Layers** – These layers represent some of the typical layers' ECCs or local GIS authorities may utilize for local purposes or to supplement their public safety GIS data.

5.1 Required Layers

Road Centerlines – This feature represents the estimated centerline of a real-world roadway.

General Rules and Requirements:

- Centerlines should be continuously updated when adjustments occur to existing road networks or when new construction occurs.
- Centerline segments should be split at:
    - Boundary intersections
    - Intersection with other segments
    - Intersection of road name change

[10] https://www.nena.org/page/NG911GISDataModel

- Elimination of gaps, overlaps or redundant road segments
- Road names should conform to the legal name as assigned by the authorized addressing entity.
- Associated attributes should be accurate, complete and standardized.
- All public and private addresses roads should be represented.

Site/Structure Address Points – This feature represents the location of a site or structure or the location of access to a site or structure. While Site/Structure Address Points is a required layer, there is no requirement for the completeness of these data. It is understood that it will take time and resources to fully develop complete and accurate address point data.

General Rules and Requirements:

- At a minimum, should represent all public and private addressable structures.
- Site/Structure Address Points should be continuously updated.
- Associated attributes should be accurate, complete and standardized.

PSAP[11] Boundary – This layer, also referred to as the "PSAP[12] Shape File", depicts the polygon(s) and related attribute information that defines the geographic area of all PSAP[13] boundaries within a given 9-1-1 Authority's geographic coverage area. The primary use for the PSAP[14] Boundary is to route call/emergency requests for NG9-1-1.

General Rules and Requirements:

- PSAP[15] boundary should be continuously updated as service areas change.
- Gaps, overlaps or redundant polygons should be eliminated.

Emergency Services Boundary (Fire, Law, EMS) – This layer defines the geographic area for the primary providers of response services. Each of these layers is used by the ECRF to perform a geographic query to determine which Emergency Service Providers are responsible for providing service to a location in the event a selective transfer is desired, to direct an Emergency Incident Data Document to a secondary PSAP[16] for

[11] NENA still references some legacy terminology within several of their Standards, Informational and Best Practices documents. Public Safety Answering Point (PSAP) is referred to as emergency communications center (ECC) throughout this document and future legislation.
[12] Ibid.
[13] Ibid.
[14] Ibid.
[15] Ibid.
[16] Ibid.

dispatch, or to display the responsible agencies at the PSAP[17]. In addition, Emergency Service Boundaries are used by PSAP[18]s to identify the appropriate entities/first responders to be dispatched.

General Rules and Requirements:

- Emergency Services boundary should be continuously updated as service areas change.
- Separate layers should be created for the following:
  - Fire Response
  - Law Enforcement
  - Emergency Medical Services (EMS)
- Gaps, overlaps or redundant polygons should be eliminated.

Provisioning Boundary – This layer defines the polygon area of GIS data provisioning responsibility. The Provisioning Boundary must be agreed to by all adjoining data provisioning providers. This Provisioning Boundary polygon layer can be used by an ECRF to facilitate exclusion of erroneous features that lie beyond the boundary, for geoprocessing purposes.

General Rules and Requirements:

- Provisioning Boundary should be continuously updated, when the authoritative area changes.
- Gaps, overlaps or redundant polygons should be eliminated.

5.2 Strongly Recommended Layers

Street Name Alias Table – The Street Name Alias Table contains alternate street names that are associated with the legal street name contained in the Road Centerline layer.

Landmark Name Alias Table – The Complete Landmark Name Alias Table contains the alternate landmark names that are associated with the Complete Landmark Name in the Site/Structure Address Points layer.

[17] NENA still references some legacy terminology within several of their Standards, Informational and Best Practices documents. Public Safety Answering Point (PSAP) is referred to as emergency communications center (ECC) throughout this document and future legislation.
[18] Ibid.

States or Equivalents – This layer contains data representing a state, or its equivalent, as a primary governmental division of the United States. Within Canada, the equivalents are the provinces and territories.

Counties or Equivalents – This layer contains data representing a county or its equivalent boundary as the primary legal division of a state, province, or territory.

Incorporated Municipality Boundary – This layer is defined as the boundary of a city, town, village, borough, or similar entity that has local governmental powers and may be useful in determining jurisdictional authority for addressing and emergency response.

Unincorporated Community Boundary – This layer is defined as the boundary of an unincorporated community, either within an incorporated municipality or in an unincorporated portion of a county, or both, and may be useful in determining jurisdictional authority for addressing and emergency response.

Neighborhood Community Boundary – This layer is defined as the boundary of a neighborhood, subdivision, or commercial area. The most intuitive way to refer to a place is often by the neighborhood name. Locations of similar sounding street names may be resolved when the neighborhood name is known.

5.3 Recommended Layers

The following GIS data layers will not be provisioned into the LVF or the ECRF but may be useful for ECC map display and 9-1-1 call taking.

Railroad Centerlines – This layer represents the estimated centerline of a real-world rail line.

Hydrology Line and Polygon – Features in Hydrology Line are the representation of creeks, streams, and rivers. Features in Hydrology Polygon are the representation of areal water body features.

Cell Sector Location – This layer represents the approximate location and coverage sector of a wireless cell tower.

Mile Marker Location – This layer represents a mile marker location as a numeric measurement from a given beginning point, which may or may not be an actual mile post.

5.4 Additional Layers

These additional data layers will not be provisioned into the LVF or the ECRF but may be useful for ECC map display and 9-1-1 call taking.

- Hydrants
- Driveways or Ingress/Egress Routes
- Parcel Boundaries (to include ownership information)
- Gates
- Bridges
- Airports / Airstrips
- Wildland Fire Response Areas (Idaho Department of Lands, United States Forest Service, Tribes, etc.)
- Tribal Trust Lands on Reservations

6. Recommendations

Recommend the State establish a NG9-1-1 GIS coordinator position.

The likely establishment of this position would be within the Idaho Information Technology Services (ITS). Currently, the ITS has four GIS Manager resources. The recommendation would be to focus a resource specifically to the NG9-1-1 GIS program, directly reporting to the IPSCC and/or 9-1-1 Project Manager/Director. The position would work with and through the Idaho Geospatial Council (IGC) Public Safety Technical Working Group, functioning as the State's NG9-1-1 GIS steward responsible for the coordination and collaboration of authoritative statewide GIS standards; GIS datasets; and educational, outreach and training programs.

It will be extremely important for a presence at the State level providing guidance in driving a set of statewide NG9-1-1 GIS standards, leading the educational outreach programs, and providing the overall leadership and guidance necessary for the program to succeed.

Recommend the State develops a State of Idaho NG9-1-1 GIS Standards and Best Practices.

This set of standards and best practices should be based on established NENA standards and best practices for NG9-1-1 GIS data development. It will be critical that any such development include representation and input from the local ECC authorities and DIGBs. This is already underway at various levels within some regional areas of Idaho via regional partnerships, partnering counties, DIGB working groups, etc. Critical to this, is the coordination of these efforts across the State with the objective and goal of establishing a single statewide set of standards and best practices[19].

The formulation of these standards and best practices typically entail the following areas:

- Background and Purpose
- National Standards Based
- GIS Data Layer Descriptions
- Data Schema
- Data Sourcing
- Data Development and Maintenance Considerations
- Stakeholder Compliance

[19] Examples: Kansas NG9-1-1 GIS Data Model, North Carolina GIS Conceptual Design Document, Pennsylvania Road Centerlines and Site/Structure Address Points Best Practices Document.

- GIS System Governance and Organization
- Stakeholder Education, Outreach, Training

Recommend the State include the following GIS dataset layers in addition to those recommended by NENA.

These additional data layers will not be provisioned into the LVF or the ECRF but may be useful for ECC map display and 9-1-1 call taking and first responder reference and support.

- Parcel Boundaries (to include ownership information)
- Driveways or Ingress/Egress Routes
- Bridges
- Airports / Airstrips
- Gates
- Hydrants
- Highway Milepost Markers
- Waterway Milepost Markers (i.e. Snake River Mileposts)
- Wildland Fire Response Areas (Idaho Department of Lands, United States Forest Service, Tribes, etc.)
- Tribal Trust Lands on Reservations
- Imagery Layer (i.e. orthophotography, Pictometry, Hexagon, etc.)
- Additional layers and features as recommended by the DIGBs

Recommend the State establish GIS stakeholder education, outreach and training program.

The establishment of an outreach program, to include education and training is essential to communicating the importance of data sourcing, data development, quality control, and maintenance of a statewide GIS dataset that follows a set of standards and best practices adopted by all parties.

The education, outreach and training program should strive to reach its intended audience through any number of avenues such as newsletters, on-line webinars, in-person training sessions, workshops, and industry provided offerings. Taking advantage of existing venues and events to facilitate outreach around IPSCC ECC Conferences, DIGB meetings, GIS user group gatherings, ID NENA and APCO conferences, etc. is an effective way of reaching a captive audience.

Recommend that an assessment be performed of each local jurisdiction's 9-1-1 GIS data to establish a baseline and determine the level of compliance with the Idaho NG9-1-1 GIS Standards. This assessment should include the synchronization of the GIS, MSAG, and ALI data.

This initial assessment can be accomplished several ways. Most often it is performed at a regional or state level through a contracted third-party vendor specializing in NG9-1-1 GIS data analysis. Some states and regional COGs have taken this on through their respective agencies and departments. Lastly, this may also be accomplished by an individual local jurisdiction. Success in any one of these options typically comes down to the availability of adequate funding, resources, and program support.

Regardless of who performs the assessment, the objective is to address and remediate the data discrepancies identified. The remediation of identified discrepancies and anomalies within the GIS, MSAG, and ALI data is an essential and necessary preparatory step prior to the aggregation and provisioning of data for NG9-1-1 call-routing functionality.

Recommend that the State aggregate local GIS data into a seamless statewide NG9-1-1 GIS dataset to be maintained and continuously updated for provisioning into any future State of Idaho NG9-1-1 system.

The State will need to take a proactive role in the coordination and overarching authority in establishing the process, cooperation, and collaboration required of the local entities to buildout a statewide aggregated NG9-1-1 GIS dataset.

The aggregation can occur at the state level as one seamless statewide dataset or at a regional level (i.e. DIGB). If the aggregation initially takes place at the regional level, it is essential for neighboring regions to coordinate efforts to ensure each of the respective regions seamlessly match or mirror one another along bordering areas. Such coordination should be addressed and governed by policies, procedures, and educational outreach developed during the formation of the State of Idaho's NG9-1-1 GIS Standards and Best Practices and the related GIS stakeholder outreach program.

Although some jurisdictions have taken on the role of data aggregator, it is often with the support of a third-party vendor. While it is certainly possible for a state or regional entity to aggregate, maintain and provision data, it is most often successfully accomplished via an outside vendor or with the assistance of a vendor. The level of resources and expertise required to initially aggregate the data, resolve data discrepancies, and maintain the

dataset at the accuracy levels required can be daunting without the required resources, funding, and support structure provided for at the State level.

A critical component of this aggregated dataset will be the ongoing upkeep required to maintain the level of accuracy necessary for the call routing function it will serve within the NG9-1-1 system. This dataset will require updates provided to it through the local entities based on a statewide Provisioning Boundary. The creation and establishment of this Provisioning Boundary will define the entity or entities that are responsible for preparing and maintaining the GIS data specific to their jurisdiction of responsibility.

A second component of the maintenance will be the establishment of what is known as a discrepancy reporting service or hub. This service can be stood up by the State itself but is often provided through a third-party vendor specializing in the aggregation and maintenance of these types of datasets. The discrepancy reporting service is the mechanism by which discrepancies in the aggregated data are identified and sent to the provisioning entity for correction. These services are generally in the form of a web portal providing a centralized mechanism and process for the aggregating agency and the local entities to coordinate the routine updating of GIS data layers into the statewide dataset and for addressing identified discrepancies within the datasets.