

July 29, 2010

Brandy Zierott
Nebraska Public Service Commission
300 The Atrium
1200 N Street
Lincoln, Nebraska 68508
brandy.zierott@nebraska.gov

RE: Docket 911-045/PI-166 Comments

To Whom It May Concern:

GeoComm appreciates the opportunity to provide comments to IP-based Next Generation 9-1-1 (NG9-1-1) questions included in the above referenced docket.

Below are our comments and responses to the questions posed in the docket.

1. Please provide information regarding the necessary statewide wireless and landline network elements and specifications for the development of an Emergency Services IP Network (ESInet) necessary for the implementation of Next Gen 911.

There are a number of entities that develop standards for 9-1-1 and those apply to Next Generation 9-1-1. Today, public safety standards are voluntary and evolving. The National Emergency Number Association (NENA) is a leading contributor to the nationwide standards for NG9-1-1. National standards are approved by the American National Standards Institute (ANSI) and other organizations contribute to the development of these evolving standards including the International Association of Public Safety Communications Officials (APCO) and the Emergency Services Interconnection Forum (ESIF). Other major contributors include the IETF (Internet Engineering Taskforce), and TIA (Telecommunications Industry Association). These standards outline necessary wireless and landline elements for developing an ESInet. In fact, these standards encompass everything from MSAG, ALI, and GIS data to network requirements to 9-1-1 call routing to policy development, the list goes on. Many of the evolving documents specific to NG9-1-1 can be reviewed at the NENA Web site <http://www.nena.org/standards/informational>.

A key document is *NENA 08-002 v1 Functional and Interface Standards for NG9-1-1 (i3)*. A revised version of this document is currently being developed and further solidifies the detailed functional and interface standards for NG9-1-1. In addition, NENA has a transition plan that outlines ways agencies, regions, or states can implement through transitional systems from today's legacy systems to a fully i3 system.



Today, GeoComm is actively involved with industry developments related to the Next Generation of 9-1-1 services (NG9-1-1) by participating in the development of standards which promise to dictate the technological fabric of emergency communications for years to come. We are an active member of the NENA Next Generation Partner Program and our team is active in the in the NENA GIS data workgroup, the Emergency Call Routing Function/Location Validation Function (ECRF/LVF) workgroup, the Policy Routing Function (PRF) workgroup, and the NG9-1-1 Industry Collaboration Events (ICE). We are also an active member of the 9-1-1 Industry Alliance.

Another key element of developing NG9-1-1 Standards is the NENA Industry Collaboration Events. These events are designed for public safety vendors to test product developed based on emerging i3 standards. One of the major test factors is interoperability. Interoperability between vendors is one of the ways that NG9-1-1 empowers you to select best-in-class solutions from multiple vendors to complete a fully functional and compliant system. This means choosing best-in-class network provider, GIS services and software provider, customer premise equipment (CPE) provider, and so on.

GeoComm participates in the Industry Collaboration Events planning and to-date; ICE -1 and ICE -2 have both occurred. At both events we tested our GeoLynx Spatial Router, NG9-1-1 Location Validation and Routing software in a NG9-1-1 Emergency Services Network (ESInet). Planning is currently underway for ICE-3.

It is important to note, the NENA standards and guidelines are comprehensive, technically detailed, and operationally detailed. They have taken years of planning to establish and vet out. Understanding how they specifically relate to the State of Nebraska Public Safety System will take much consideration and study by state stakeholders. A custom approach is required at a PSAP level, regional level, or statewide level, which begins with a needs assessment to determine the best plan for that jurisdiction or group of 9-1-1 authorities. NG9-1-1 is not a "one-size-fits-all" proposition. There are decisions for governance, funding, policy, operations, technology, and meeting state, regional, and PSAP level needs for providing 9-1-1 services that need to be considered. There are also numerous and complex issues involved in transitioning current systems, networks, CPE, software, GIS, and databases to a Next Generation model.

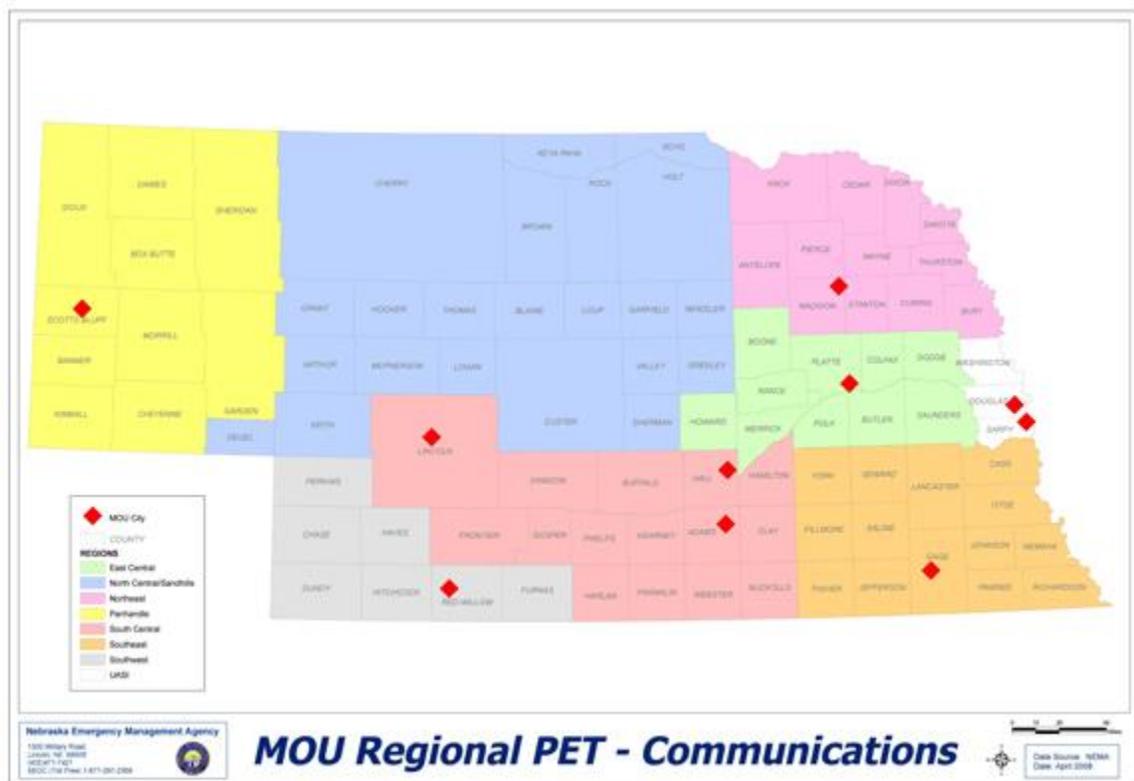
- a. Should a statewide network be established or should regional ESInets be coordinated.

This is a question that every state and every region is working through right now. It is yet to be seen what the preferred model nationwide is. There will be states who develop a statewide network backbone and others where NG9-1-1 emerges from the regional or local PSAP level.

Deciding whether Nebraska should implement a statewide network or regional networks or a combination of the two involves gaining an understanding of the overall

system goals, needs of the end users, needs for routing 9-1-1 calls between various agencies, and many other considerations. There are also considerations for governance and financing the system. These considerations often drive the direction taken from a statewide perspective. In fact, governance and financing are two of the main considerations to determine at the outset before moving too far along the path technology-wise. This is where it is critical to set in place a transition plan that investigates all of the considerations and lays out an agreeable rollout of a statewide ESInet or regional ESInets.

The State of Nebraska could decide to implement a statewide ESInet with regional ESInets for each of Nebraska's Planning, Exercise and Training (PET) Communication Regions which were established by legislation for homeland security and public safety purposes.



Using that model, you could envision a statewide network that is a combination of eight ESInets and that each of those ESInets connect out to the PSAPs in the already established regions.

Of course, there are many alternatives to this layout including a statewide network that connects to all of the PSAPs or regional or PSAP ESInets based on population or call volume. You could also base the implementation on PSAPs that already have regional agreements or already share 9-1-1 dispatching responsibilities. All of these elements

plus governance, funding, operations, and technology need to be considered before deciding how to move forward.

b. To what extent are these components currently in place?

The Nebraska Council of Regions (NCOR), which provides oversight and integration for the eight local public safety communications regions in Nebraska, recently awarded a bid for a statewide broadband network which will initially be used to link the eight communications regions across the state as a part of the Nebraska Regional Interoperability Project. The vendor will be providing a wireless solution with to all (PSAP's) in each region. It is possible, after further investigation and evaluation of this system in relation to the 9-1-1 needs of the State of Nebraska that this network could be a foundation or an element of the NG9-1-1 network. Knowing that for certain will take understanding what is available and then comparing that to NG9-1-1 evolving standards and the needs of the State of Nebraska.

c. What upgrades in the statewide telephonic and broadband network are needed, if any?

When building a NG9-1-1 network many factors must be taken into consideration including implementing over an MPLS, security, redundancy, diversity, bandwidth, connection points at PSAPs, gateways, system routing components, optimal and accurate data, and many more considerations. Identifying the upgrades required for the State of Nebraska will take a thorough examination of what network components are in place today and how to migrate or transition to a NG9-1-1 network either on a region by region basis or statewide.

One of the main technical premises of NG9-1-1 is that 9-1-1 call routing shifts from being routed via selective routing in a traditional hardwired telephone system to being routed through Internet Protocols (IP) based on geographic location and policy rules. This means there are myriad considerations for implementing an ESInet capable of handling that traffic in a secure and quick manner. Other considerations include the development of a NG9-1-1 standard GIS data set for geographic routing within the network and the development of policy rules related to the state, region, or PSAP(s).

GeoComm has generally discussed the broadband network with the vendor providing the system and it appears that most regions are assuming use of the network for radio interoperability only. It would stand that there could be additional capacity on this existing network which needs to be discovered by thorough review of the network in relation to NG9-1-1 standards and the needs of the state for routing 9-1-1 traffic in an ESInet and the capacity to carry information on the network with a 9-1-1 "call" such as text, voice, images, videos, etc. There are additional considerations for packaging additional data, as described in *NENA 71-001 NG9-1-1 Additional Data*, which includes

data about a caller such as emergency contact information or a location such as streaming video cameras or building information such as premise contacts and physical data. The State of Nebraska will also need to consider all of the elements associated with making it a secure emergency services network with board controls and built in redundancies. All of these elements need to be considered in relation to the State of Nebraska's telephonic and broadband network in order to determine the required upgrades.

There are guidelines the State of Nebraska can follow and a third party expert could also assist in conducting an intense analysis on the existing systems, NG9-1-1 requirements, and needs of the state in order to develop clear recommendations for developing a transition plan for a statewide or regionalized E911(s).

d. What costs may be incurred to establish or upgrade the necessary networks?

GeoComm recommends the State of Nebraska consider the various technical and operational options in line with associated costs estimates based on thorough review of existing network components and PSAP equipment and software. NG9-1-1 is not a "one-size-fits-all" proposition; instead, it empowers states, regions, and local PSAPs to select best-in-class solutions from multiple service providers at a pace that makes financial sense.

Costs could be anywhere from a minimal thousands of dollars to millions of dollars statewide. Since the State of Nebraska is not outlining the exact plan they would like to take for networking, statewide vs. regionalized, and it is unknown the readiness of each PSAP, costs cannot be adequately predicted at this time.

There are numerous cost considerations including network, network software, PSAP equipment and software, transition services, and GIS services. These costs could be properly outlined once the State of Nebraska identifies a recommended plan for transition to an NG9-1-1 network and NG9-1-1 PSAPs implementations.

e. What costs may be attributable to the provision of wireless enhanced 911 services?

Costs attributable to the provision of wireless enhanced 9-1-1 systems could include anything from existing network enhancements as discussed above to transition management services from a third party provider to upgrades in Nebraska's PSAPs to enable call handling of text, video, images, and the viewing of additional data about callers, call devices, location, and PSAPs. Obviously, the costs paid by the Wireless Fund for interconnections from all wireless carriers would still apply, but may be less as the wireless carriers could enter the network at fewer points versus having to deliver calls to multiple selective routers across the state owned by various local exchange carriers

today. Although fewer network entry points are an advantage of regional ESINets, networks need to be connected and distributed at the PSAP, with a comparable level of security, redundancy, and diversity that is recommended for today's transport.

In addition, there are considerations for the enhancement of the State of Nebraska's GIS data. The State of Nebraska is a leader in having the potential to create a seamless statewide GIS data set that can be used in a statewide network for 9-1-1 call routing based on geography. There are a number of steps to take for determining how to take all of the disparate data sets from the various 9-1-1 authorities, create a GIS data model for the state, enhance the data for NG9-1-1 call routing including the addition of PSAP service area boundaries and additional emergency service provider area boundaries, and then to maintain that statewide GIS data set on-going. This is a critical piece of the NG9-1-1 network because in a pure i3 system the Master Street Address Guide (MSAG) and Address Location Information (ALI) database are no longer databases used for routing 9-1-1 calls. Instead, based on geographic location, calls are routed using GIS data in the network. Preparing the State of Nebraska's GIS data for NG9-1-1 call routing is an important transitional step that can be started right away.

Engaging in a statewide analysis would enable the State of Nebraska to develop cost estimates based on recommended methodology for implementing a statewide or regionalized ESInets.

2. At the individual public safety answering point (PSAP) level, what equipment, software and network elements are necessary for the implementation and operation of Next Gen 911?

At the PSAP level, at some point in the State of Nebraska's NG9-1-1 transition, PSAPs need to be equipped with NG9-1-1 i3 capable call handling systems in order to handle calls that are enabled by an ESInet: supporting real-time text, videos, images, etc. In order to fulfill the – any device, anytime, anywhere proposition, telecommunicators need call handling systems equipped with features and functions for communicating using these new modalities. Implementing a NG9-1-1 network without a plan for updating the PSAP software and equipment is not a complete plan to transition to NG9-1-1. Having an IP CPE is not enough because that does not mean it is NG9-1-1 capable.

There are legacy gateways from a NG9-1-1 ESInet to legacy PSAPs that allow agencies to transition in a phased approach versus a forklift change. This allows agencies to make considerations for funding over a period of time rather than all at one time. These legacy gateways are not intended to be long-term, but rather to assist in the transition to a fully i3 NG9-1-1 system.

GIS mapping in an i3 NG9-1-1 environment can be on-site at the PSAP or can be provided to the PSAP as an application on the ESInet. It is also beneficial to have a GIS mapping system

where you can display GIS and calls from outside of your immediate jurisdiction in the event that a call is policy routed to your PSAP due to loss or sudden unavailability of the nominally routed PSAP.

Aside from hardware and software in the PSAP there are countless things to consider related to operations, policy, governance, funding, and technology.

Operationally, decisions need to be made around business rules and how this will affect 9-1-1 operations. For example, deciding if the PSAP is going to accept text messages or video images along with 9-1-1 calls and how they will be handled.

Regarding governance, if the State of Nebraska decides to use the broadband network being implemented under the direction of NCOR, NCOR along with the PSC should obviously be included in the discussions pertaining to potential governance models.

For operations, governance, funding and technology considerations:

First, research concepts, potential benefits & risks:

- Do these potential new features have real value to my PSAP, the Region within which we serve? Are these values immediate or future oriented?
- Can we consider shared systems without losing of “local service” expectations?
- With whom would we be sharing data? Benefits vs. Risks
- If we joined others in such a project, is there a next level of connectivity to support our operation?

Second, recognize the potential inhibitors:

- Can my PSAP deal with all these alternate access paths?
- Are there compelling local reasons and support with adequate understanding to move toward NG9-1-1?
- What about the potential partnership issues?
- What if I wait? Who do I ask questions?

Third, accept the management considerations:

- Direct/indirect costs and sustainable funding
- Data responsibilities, new rules, and standards
- Staff Training, managing public expectations
- Cooperation, collaboration and coordination with your new partners, a potential new governance model

Fourth, timing and implementation strategies:

- Knowing and understanding the issues is important
- Do I fully understand all the activity within my area related to this topic?
- Do my partners and leadership group understand it all?

These considerations are some of many that need comprehensive attention by the State of Nebraska and 9-1-1 authorities to start to determine the best approach. These considerations are often best weighed with the assistance of an objective third party with governance, operational, funding, and technical expertise in the area these questions are being considered.

a. To what extent are the PSAPs properly equipped?

Based on GeoComm's analysis, perhaps one fourth of the Nebraska PSAP's have VoIP capable telephony equipment. That is not to say that this VoIP capable equipment will interact properly with an i3 NG9-1-1 network, since i3 requirements are emerging, with the i3 Stage 3 document nearing the public review phase. An NG9-1-1 network can be connected to legacy PSAPs and using technology called "legacy gateway(s)". PSAPs would be able to operate on the NG9-1-1 network using their legacy analog equipment during the transition period to being a NG9-1-1 PSAP. To be a pure i3 system, each PSAP will need to be connected to an emergency services network and capable of accepting 9-1-1 calls (i3 SIP with PIDF-LO and pointers to NG additional data) to the PSAP by and Emergency Services Routing Proxy (ESRP). This most likely requires new PSAP communications and telephony equipment. It can also include updated location information display, GIS map display, and an updated call taker user interface to view text, video, pictures, etc.

In effect, we would recommend a full PSAP by PSAP inventory of current equipment and networking capabilities. This way, the State of Nebraska and the PSAPs will be able to research and determine needed PSAP upgrades to become a NG9-1-1 PSAP.

In addition, there is a major component to PSAP involvement in a NG9-1-1 system and that is the data used for routing 9-1-1 calls. In NG9-1-1 all calls are routed based on geography and policy. Therefore, when a 9-1-1 call is placed in the ESInet, a routing proxy first queries GIS data with the caller location in order to determine the correct PSAP to route the call to based on PSAP service area boundaries stored in the GIS database. The local 9-1-1 authorities are responsible for the accuracy of their NG9-1-1 GIS data set. While agencies may currently have highly accurate or highly synchronized GIS data, there are additional considerations for a NG9-1-1 data set in order to be used for NG9-1-1 call routing within the ESInet such as ensuring seamless, gapless coverage when GIS data from multiple, disparate authoritative sources is merged into a single GIS database for 9-1-1 call routing.

We recommend that the State of Nebraska undergo a data set by data set analysis in order to determine the data work required to enable NG9-1-1 GIS based call routing in the ESInet using NENA i3 ECRF/LVF functional elements. From there, the data could be developed and enhanced to meet the standards needed which include additional attribute data and resolution and management of boundary gap/overlap issues.

Following that, a plan for maintaining a statewide GIS data set would need to be implemented.

- b. What upgrades may be necessary for individual PSAP equipment and software or network infrastructure to the PSAP?

A PSAP by PSAP inventory and analysis would be needed to determine what specific upgrades are necessary at each individual PSAP. However, it is likely that communications and telephony equipment will require updates in order to accept i3 9-1-1 calls and the enhanced features available with an i3 network. Updates can also include upgrades to location information displays, GIS map display, GIS data improvements and updated call taker user interface to view text, video, pictures, etc.

Please see above answer in 2.a.

- c. What costs may be incurred to properly equip PSAPs and their respective networks?

Costs could be anywhere from a minimal thousands of dollars to millions of dollars statewide. Since the State of Nebraska is not outlining the exact plan they would like to take for networking, statewide vs. regionalized, and it is unknown the readiness of each PSAP, costs cannot be adequately predicted at this time.

There are numerous cost considerations including network, network software, PSAP equipment and software, transition services, and GIS services. These costs could be properly outlined once the State of Nebraska identifies a recommended plan for transition to an NG9-1-1 network and NG9-1-1 PSAPs implementations.

- d. What training may be necessary to ensure proper handling of increased information available through Next Gen 911?

Training that may be necessary based on implementing a NG9-1-1 network could include:

- Policy training on what new data will be available and how it should be handled
 - Data Maintenance
 - Policy Routing Function rules development
- User training on new call handling software/hardware
- GIS data maintenance workflow training to ensure data for routing calls in the network is accurate and synchronized

e. How may smaller PSAPs be uniquely affected?

Smaller PSAPs may be uniquely affected a number of ways based on levels of funding and how the state, region, or local authorities decide to operate within the system. If funding is available, smaller PSAPs can migrate to the same NG9-1-1 system as neighboring PSAPs. If funding is limited, then smaller PSAPs can operate with current legacy technology and legacy gateways into the same network used by their neighbors. In affect, they will be able to participate in one way or another.

On a services level, a fully functional NG9-1-1 system will allow for PSAPs to transfer call taking responsibilities more easily than in a legacy system. Policy rules can also be set up so smaller PSAPs can have calls automatically routed to a neighboring PSAP once they reach a certain call volume capacity. Alternatively, smaller PSAPs can set up rules with other PSAPs on the network to handle all of their calls during certain shifts or holidays. It is all based on how the local authority or funding authority wants to set up the network and how that is determined to affect the 9-1-1 authority's operations.

f. What costs may be attributable to the provision of wireless enhanced 911 services?

All wireless 9-1-1 voice calls will be handled by the NG9-1-1 system. With the implementation of an NG9-1-1 system, additional call types from wireless devices will also be acceptable as long as the 9-1-1 authority agrees to handle them including text messaging, video messaging, or sending still photos.

Funding is one of the major components requiring further discussion. As stated previously, carrier interconnect costs may be less, but equipping the PSAPs with new technology may be quite expensive.

3. In implementing Next Gen 911, what 911 data bases will be required?

NG9-1-1 requires many databases. A short list includes the following databases:

- Location Information Services (LIS)
- NENA Standard Geographic Information Systems (GIS) Database containing service area boundaries for PSAP, law, fire, medical, and other types of emergency responders, as well as civic (street address) location GIS data such as site/structure points or polygons, and/or address ranged road centerline layers.
- Policy Routing Function- list of routing rules/policies

- a. In what way will Next Gen 911 affect the existing Master Street Address Guide; and

The existing Master Street Address Guide (MSAG) will no longer be used to route 9-1-1 calls in a NG9-1-1 network. The GIS data will take on the attributes of the MSAG to essentially replace it as the routing mechanism for 9-1-1 calls. Of primary importance is not the conversion process itself but the accuracy of the underlying GIS data that is used for location verification and routing in the Next Generation 9-1-1 model. Since current ALI database validation is based on the MSAG, the existing ALI database and the MSAG should be compared to GIS data and guidance provided to 9-1-1 authorities based on *NENA 71-501 Synchronizing GIS with MSAG & ALI*. All discrepancies must be noted, meticulously analyzed, and database corrections made. Corrections must occur in all three databases, as necessary, to result in a highly accurate suite of data before proceeding to NG deployment. Synchronization must occur for GIS data to reach the point of accuracy necessary for critical processes in the NG9-1-1 system, such as LVF and ECRF.

- b. Who will be responsible for creating and maintaining the various data bases required?

As a practical matter, individual 9-1-1 authorities are responsible for maintaining the GIS data for NG9-1-1. This means that either the 9-1-1 authority can maintain the database, or they can team with neighboring counties for a regional database, there can be a statewide database, the work can be contracted out to a third party and so on. In addition, the maintenance of the Policy Routing database will be determined based on the governance model in place for the specific system. This database houses local routing determinations and, therefore, requires participation by local policy officials to determine database content.

Maintenance of the LIS is somewhat debatable right now. We recommend that the State of Nebraska require all service providers to populate a LIS (either self-maintained or contracted) at no cost to the PSAP (or governing body). Maintenance of an interconnected LIS should be considered a cost of doing business for any company involved in subscriber telecommunications services.

4. Please comment regarding the appropriate state or local authorities to direct and coordinate the implementation of Next Gen 911 with respect to the receiving and processing of 911 calls. In commenting please also provide the following:

NG9-1-1 is best directed and coordinated by the public safety authorities within a state, region, or at the local level. Some states direct and coordinate at a state level through a state 9-1-1 office. Other states are regionalized and still others everything will come from the ground up through the local 9-1-1 authorities.

- a. The basis for their authority;

These governing bodies have authority because they are charged with and funded for providing 9-1-1 services to their citizenry.

- b. Funding available to the entity; and

In the State of Nebraska, PSAP's have begun to receive wireless funding through the new allocation model. This funding could be utilized for upgrades to CPE as well as GIS mapping to accommodate NG9-1-1.

- c. The level of technical expertise needed and currently available.

The level of technical expertise needed can be extensive or very little. If it is not available within the state, region, or local 9-1-1 authorities, it can be contracted through consultants or other third party vendors.

5. Please comment regarding the various funding sources that may be available for the implementation of Next Gen 911?

Based on the assumption that the Nebraska Regional Interoperability Project will provide a broadband network with adequate capacity for NG9-1-1, the combination of local telephone surcharge and wireless funds may be sufficient to implement NG9-1-1 in Nebraska. Other states are leveraging local available funds and federal grants opportunities.

6. Please comment regarding any statutory changes that may be necessary to implement Next Gen 911.

Some changes may be necessary to allow for the extension of the Public Service Commission's role in Next Generation 9-1-1. In addition, GeoComm would encourage updates and revisions to Nebraska State Statutes pertaining to 9-1-1 emergency services to include the new terms, conditions and technology which are part of NG9-1-1.

The State of Nebraska should consider compelling all telecommunications service providers to interconnect with Next Generation 9-1-1 systems, extend the same level of liability protection to all next generation vendors as is currently afforded to certified telecommunications service providers, and should require all service providers to populate a LIS (either self-maintained or contracted) at no cost to the PSAP (or governing body). Maintenance of an interconnected LIS should be considered a cost of doing business for any company involved in subscriber telecommunications services.

7. Please comment as to any other issues that should be addressed related to the implementation, coordination, and funding for the implementation of Next Gen 911.

No additional comment

Please feel free to contact me at (800) 335-4255 or by e-mail at sgross@geo-comm.com with any follow-up questions or comments pertinent to the information contained herein.

Sincerely,



Stacen C. Gross
Regional Account Manager