2018-77

GEOCOMM	**Work Order # 20180920—KCNE** **GeoLynx Server Dispatch Mapping System** September 21, 2018
Geo-Comm, Inc. 601 W. Saint Germain St. St Cloud, MN 56301 Phone (320) 240-0040 Fax (320) 240-2389	**Keith County Emergency Operations Center, Nebraska** Laurie Hood, Emergency Services Director 501 N. Spruce Street Ogallala, Nebraska 69153 (308) 284-2011 lhood@keithcountyne.gov

Description	Total Price
GeoLynx Server GIS Setup Services and Surrounding County Data Addition	$1,000
Network Routing GIS Dataset Development Services	Included
GeoLynx Server Dispatch Mapping Licenses (3)	$15,000
Standard Dispatch CAD Interface	$5,000
GeoLynx Server 9-1-1 Call Viewing	Included
GeoLynx Server Dispatch Mapping Installation and Training	$7,970
GeoLynx Server Dispatch Mapping Project Management Services	$3,627
Network Routing GIS Dataset Annual Maintenance Services (Year One)	Included
GeoLynx Server Dispatch Mapping Licenses Annual Software Support and Maintenance (Year One)	$3,000
Standard Dispatch CAD Interface Annual Software Support and Maintenance (Year One)	$1,000
GeoLynx Server 9-1-1 Call Viewing Annual Software Support and Maintenance (Year One)	Included
Annual GIS Data Provisioning Services – Quarterly Updates (total of 4 updates) (Year One)	Included
Network Routing GIS Dataset Annual Maintenance Services (Year Two)	Included
GeoLynx Server Dispatch Mapping Licenses Annual Software Support and Maintenance (Year Two)	$3,000
Standard Dispatch CAD Interface Annual Software Support and Maintenance (Year Two)	$1,000
GeoLynx Server 9-1-1 Call Viewing Annual Software Support and Maintenance (Year Two)	Included
Annual GIS Data Provisioning Services – Quarterly Updates (total of 4 updates) (Year Two)	Included
Network Routing GIS Dataset Annual Maintenance Services (Year Three)	Included
GeoLynx Server Dispatch Mapping Licenses Annual Software Support and Maintenance (Year Three)	$3,150
Standard Dispatch CAD Interface Annual Software Support and Maintenance (Year Three)	$1,050
GeoLynx Server 9-1-1 Call Viewing Annual Software Support and Maintenance (Year Three)	Included
Annual GIS Data Provisioning Services – Quarterly Updates (total of 4 updates) (Year Three)	Included
Network Routing GIS Dataset Annual Maintenance Services (Year Four)	Included
GeoLynx Server Dispatch Mapping Licenses Annual Software Support and Maintenance (Year Four)	$3,308

Standard Dispatch CAD Interface Annual Software Support and Maintenance (Year Four)	$1,103
GeoLynx Server 9-1-1 Call Viewing Annual Software Support and Maintenance (Year Four)	Included
Annual GIS Data Provisioning Services – Quarterly Updates (total of 4 updates) (Year Four)	Included
Network Routing GIS Dataset Annual Maintenance Services (Year Five)	Included
GeoLynx Server Dispatch Mapping Licenses Annual Software Support and Maintenance (Year Five)	$3,473
Standard Dispatch CAD Interface Annual Software Support and Maintenance (Year Five)	$1,158
GeoLynx Server 9-1-1 Call Viewing Annual Software Support and Maintenance (Year Five)	Included
Annual GIS Data Provisioning Services – Quarterly Updates (total of 4 updates) (Year Five)	Included
Standard Dispatch CAD Interface Price Adjustment:	($5,000)
Five Year Grand Total:	$48,839

Geo-Comm, Inc. (GeoComm) will deploy a GeoLynx Server Dispatch Mapping system at Keith County Emergency Operations Center (Keith County), supporting three dispatch positions. The system will be deployed with routing and CAD interface functionality. Annual software support and maintenance services will be provided for five years. A full scope of work is attached to this Work Order as Exhibit A. Keith County responsibilities are attached to this Work Order as Exhibit B.

Keith County agrees to the following payment terms:

- $15,000 invoiced net 45 days upon contract signing
- $16,597 invoiced net 45 days upon completion of software installation and training
- $4,000 invoiced net 45 days at the beginning of year 2 software support
- $4,200 invoiced net 45 days at the beginning of year 3 software support
- $4,411 invoiced net 45 days at the beginning of year 4 software support
- $4,631 invoiced net 45 days at the beginning of year 5 software support

Agency: Keith County Emergency Operations Center, Nebraska
Agency PO# (if required by Customer)
Print Name: Lonnie J Peters
Signature: Lonnie J Peters
Date: 12-19-2018

Project Approach

GeoComm will complete the following phases for timely completion of your project:

- Phase One: Project Initiation
- Phase Two: GIS Services
- Phase Three: System Configuration, Testing, and Implementation
- Phase Four: System Training
- Phase Five: Acceptance Test Plan Execution
- Phase Six: Software Support and Maintenance

Throughout each phase, GeoComm will dedicate time to project management and ongoing communication. By partnering with GeoComm, you will know the status of your project, that deliverables are being met, and have confidence your objectives are being carried out. GeoComm will provide regular status updates which will include:

- General progress updates
- Meetings held, planned, or needed
- Issues/problems encountered or anticipated
- Goals for the next reporting period
- Schedule review
- Keith County responsibilities

Phase One: Project Initiation

At the start of the project, GeoComm will assign a project team. The project team will be assigned the project elements, both technical and administrative, to ensure timely completion of the project. The team is a combination of the project-appropriate GIS and 9-1-1 systems experts who will collaborate to deliver the required project components.

One of the first activities of the project team will be to ensure the team has an accurate understanding of Keith County's project objectives. The team will communicate internally to understand the scope of work, project schedule, and individual responsibilities. This is an important step towards successful and timely project completion.

Once the team is established and has communicated the project objectives, a project initiation meeting will be scheduled and conducted with the Keith County project team. At this meeting, the GeoComm team will present our approach and anticipated project schedule. The meeting agenda will include:

- Introductions and identification of project team members and roles
- Timeline and deliverable review
- Project approach review

- Project communication methods

Phase Two: GIS Services

Surrounding County Data Addition

We will add surrounding county GIS map data layers to your map data for use in GeoLynx Server. Map layers which may be added include Roads, Address Points, Emergency Service Zones, and Community Boundaries. If available, these layers will be added for Cherry County, Nebraska; Cheyenne County, Nebraska; and Sedgwick County, Colorado.

The surrounding county map data will be edge-matched and appended to your GIS base map layers, extending 9-1-1 call plotting and address search capabilities into neighboring counties. The location and number of calls that plot depends on the quality of the surrounding county map data provided. Surrounding County map data must be synchronized with the Master Street Address Guide (MSAG) and Automatic Location Identification (ALI) database to accurately plot 9-1-1 calls.

GIS map data used for this project may come from one of the following sources:

- GeoComm – GIS map data developed by GeoComm, currently maintained by GeoComm, or data which has been used in past GeoComm projects may be used if authorization is granted by the surrounding county. GeoComm will not use this data without the surrounding county's written permission.
- The Surrounding County – County-provided GIS map data may be used if GeoComm does not already have the GIS data on hand or if existing GIS data is outdated. GIS map data from the surrounding county must be provided within 30 days from the date requested, in Esri format, with projection information included.
- Nebraska Public Service Commission (NEPSC) – GIS map data will be downloaded from the NEPSC GIS data repository for any Nebraska Counties who authorize use of their data for this project.
- publicly Available GIS Data – If a surrounding county does not authorize use of their GIS map data for this project, or if GIS map data is not provided within 30 days, publicly available GIS data downloaded from the US Census Bureau or other source may be used upon request.

Note: GeoComm cannot guarantee the accuracy of any GIS map data not currently maintained by GeoComm. Publicly available GIS data may not meet accuracy standards for public safety mapping. If publicly available GIS data is used for this project, Keith County assumes all liability for errors and omissions contained therein.

We are willing to reach out to the surrounding counties directly; however, Keith County must provide the name and contact information for the entity that will be supplying the appended dataset for each county.

The surrounding county addition is a one-time service. Other than edge matching, no adjustments will be made to the data and no data will be developed or maintained.

Network Routing Dataset Development

GeoComm will update Keith County's road centerline layer to meet minimum routing attribute requirements for the GeoLynx software. Using Esri's Network Analyst Extension for Desktop and based on resources provided by Keith County, GeoComm will build a network routing dataset to support vehicle routing within the software.

In compliance with the GeoComm map data specifications, GeoComm will add the following attribute fields to the road centerline layer (if not already present) and populate them as described below.

Field Name	Field Type (width)	Field Description	Population Method
[illegible]	[illegible]	[illegible]	[illegible]
Speed	Long Integer or Text	Speed limit	Populated with a value indicating the speed limit of the segment
Distance	Double	Length of each road segment (e.g. miles, kilometers, etc.)	Populated with a value indicating the length of the segment
Minutes	Double	Estimated drive time in minutes based on segment length and assigned speed limit	Populated with a value indicting the number of travel minutes of the segment. The value in the field can be calculated using the assigned speed value and the length of the road segment.

After the attribute work is completed, GeoComm will use the updated road centerline layer to build a network routing dataset for vehicle routing. The network routing dataset will reside within the File Geodatabase containing the master map layers or ArcGIS packages for the implemented software.

GIS Setup Services

GIS map data is an important element in efficiently responding to 9-1-1 calls. For any specialized GIS software, the GIS data must meet certain minimum map data specifications. Because GIS data is produced in many different formats and file structures, it is possible your GIS map data may need to be adapted to work cohesively within the software.

Prior to software configuration and implementation, we will work with Keith County to ensure the final map configuration meets your preferences and needs. Our team uses years of expertise in GIS map data development, management, and analysis to provide you with the most effective GIS map data solutions. GeoComm will:

- Convert the format of your GIS map data and develop an Esri geodatabase, if required.
- Supply minimum GIS map data specifications for reference during the set up and configuration process and review those specifications, via a conference call, to ensure an understanding of the software needs
- Review the map data structure and file naming and deliver a written document outlining any required and recommended modifications.
    - Make recommendations on how to make those modifications to create an acceptable format for successful integration into the GeoLynx software.
    - Report any issues regarding desired configurations that may affect the system performance and discuss options.
- Review the map data for topology issues and report findings.
- Review the road centerline layer for overlapping address ranges and report findings.
- Coordinate and identify miscellaneous GIS map data layers which may enhance the GeoLynx software.
- Initially design and set up the Esri ArcGIS map documents (.mxd) (layers, layer order, layer visibility, scale dependent display, symbology, labeling, etc.) based on Keith County's preferences.
- Build and configure address locators for geocoding.
    - Address locators are a required component of the Esri geocoding engine used in GeoLynx software to plot wireline 9-1-1 calls and search for features. Address locators define the process for searching. They allow users to find address locations throughout a variety of individual reference layers such as streets, parcels, address points.
- Configure and test optimized GIS services and enable capabilities (e.g., map, feature, geocode, etc.).
- Set up and configure map caching.
- Publish optimized GIS services.

Phase Three: System Configuration, Testing, and Implementation

At this point in the project, the project team will be coordinating an agreeable time for on-site implementation services. GeoComm will provide system diagrams, GIS map documents, and system architecture plans for review by the project team and to improve overall project and future system maintenance understanding.

System Configuration and Testing

Once the GIS data setup is complete, GeoComm will prepare the system for on-site implementation. Configuration includes a variety of tasks:

- Test and verify GIS map data setup

- Configure licensing, including all technical components
- Configure user and admin settings and features
- Test address locations
- Test and/or configure simulated 9-1-1 calls and CAD event layer
- Configure any required interfaces
- Configure routing, if applicable

System Implementation

System implementation is planned in advance with the project team to ensure the least disruption to existing, on-going operations. Prior to the on-site implementation, Keith County must ensure all requirements listed in this work order are met. When on-site, the implementation specialist will:

- Install and configure the software
- Configure user and admin roles
- Assist in standard set up of the system (i.e. Views, Pictometry)

Phase Four: System Training

GeoComm will provide Keith County comprehensive user and administrator training. The following training sessions will enable users and system administrators to maximize the usage of the system following installation.

GeoLynx Server Training

	Administrator Training	User Training
Audience	**System Administrators**	**System Users**
Duration	Up to 4 hours	2-4 hours (depending on add-on functionality)
Class Size	**2-4**	**8**
Number of Sessions	1	2

Help Guide

Following training, at a simple click of a button, system users will have immediate access to GeoComm's online help guide. The help guide provides all the information users need for operation, administrative set up, and configuration of the software. With the easy-to-use search feature, answers are quickly found rather than thumbing through countless pages in a paper manual.

Another benefit of the on-screen help guide is the information within is always up-to-date. With each service pack or system release, the on-screen help information is updated as part of the release, eliminating out-of-date paper manuals.

Phase Five: Acceptance Test Plan Execution

After the software is implemented and training is complete, GeoComm will complete a software acceptance test plan to ensure the final installation has been tested. GeoComm's technical team of Implementation Specialists, Software Development, Testing, and Support Analysts will work with Keith County to ensure all functionality contracted for is included in the final system. If any gaps are identified, a plan for resolution will be developed.

Phase Six: Software Support and Maintenance

Immediately following software installation, software support and maintenance will commence and continue for one year. GeoComm's software support and maintenance includes:

- Support Desk Services
- Remote Connection Services
- Software Updates and Enhancements
- Network Routing Dataset Maintenance

Support Desk Services

Support desk services consist of technical assistance and product coaching by trained, experienced specialists in an advisory capacity via a toll-free telephone number or e-mail relating to the operation of any portion of the GeoLynx Family of Products. All calls for service are logged in NetSuite, GeoComm's customer relationship management software. Upon receiving communication regarding a software issue, the Technical Support Analyst will work with you to resolve it. If all analysts are busy assisting other customers, a return telephone call will be made.

Emergency calls are addressed 24 hours a day, 7 days a week via a toll-free number/pager system based on mission critical nature of the GeoComm solutions implemented as indicated in the response table below. A technical staff member will return your emergency calls requiring immediate attention. GeoComm defines emergency calls as one or both of the following:

- System alarms where software does not process calls
- System locks up repeatedly without ability to recover

Our response to customer issues is fast because GeoComm develops all software components, trains its technicians on advanced troubleshooting methods, can remotely connect to your system, and are able to interact with your software via the web. This results in quicker diagnosis and call closure. Ultimately, this means less downtime and maximum software functionality benefits.

During our regular business hours, 8 a.m. to 5 p.m. Central Standard Time, Monday through Friday, excluding holidays, you will be allowed unlimited toll-free calls and e-mails related to any concern with the software.

If the hotline is called outside of regular business hours with non-emergency matters that could be addressed during regular business hours, you will be billed for such calls at a rate of $121 per hour (minimum one hour). These fees will be payable, in addition to the normal annual support and maintenance fee, within 30 days of receiving an invoice.

GeoComm's response time commitment is depicted in the following table:

Priority	Description	Response Time	Solution
Critical Impact – Service Not Available	Service is unavailable or halted Data is unavailable or nonfunctional Service productivity or functionality is severely compromised There is a complete loss of service for all End Users and there is no ability to avoid or reduce the incident via a workaround	Less than two clock hours 24 x 7	GeoLynx Server Dispatch Mapping GeoLynx Desktop GeoLynx Spatial Router
Major Impact – Severely Impaired	Service performance/functionality for all End Users is seriously impaired or degraded Data accuracy is seriously impaired There is no ability to avoid or reduce the effect of the incident via a workaround	Less than four clock hours 24 x 7	All
Minor Impact – Minimal Degraded Performance or Functionality; Single User Issues	Service has encountered a non-critical issue with minimal loss of performance/functionality Data accuracy is minimally degraded May be identified as a functional defect Complete stoppage of a Single End User A partial loss of service for an End User and there is a way to reduce the effect or completely avoid the impact of the incident via a workaround at a reasonable cost	Less than 16 business hours Monday through Friday 8 a.m. to 5 p.m. Central Standard Time	All
Low Impact – Single User Application Issue	Service is unavailable or degraded (not a complete work stoppage) for a Single End User There is a way to reduce the effect or completely avoid the impact of the incident via a workaround at a reasonable cost	Less than 24 business hours Monday through Friday 8 a.m. to 5 p.m. Central Standard Time	All

Priority	Description	Response Time	Solution
[redacted]			

Concerns or questions specifically related to GIS can be answered by a GeoComm GIS Specialist but will be billed at an hourly rate a minimum billable charge of one hour.

Remote Connection Services

Support also includes remote connection into your software for troubleshooting by Technical Support Analysts. Remote connection services do not cover calls related to issues with other vendor's systems.

The standard and preferred method for connection is GoToAssist over the Internet. GoToAssist sessions are protected by end-to-end, government-approved, 128-bit Advanced Encryption Standard (AES) encryption, as well as Secure Sockets Layer (SSL) encryption of point-to-point connections. Additional GeoComm remote connection capabilities include:

- Remote Desktop
- Microsoft VPN
- Cisco VPN

Software Updates and Enhancements

GeoComm recognizes the importance of continued software enhancements and innovation. Our software applications are systematically developed to ensure new software enhancements and latest technological changes are incorporated regularly into each of the GeoComm software applications.

Our Software Development Team is responsible for staying on top of all industry-related developments and incorporating desirable features into our software family of products. Features incorporated into the latest software releases are based on a variety of factors, such as industry changes, customer requested enhancements, and the overall impact to our customer base, etc.

GeoComm regularly releases service packs and feature packs containing fixes and new functionality, respectively. Software support and maintenance customers are eligible for receipt of all new service packs and feature packs for the term of their agreement.

Upon release of a service pack or feature pack, affected and eligible customers are notified by phone or e-mail. Based on the contents, GeoComm Technical Support will determine the most effective method for making the software available.

Network Routing Dataset Maintenance

As part of Keith County's annually renewable GIS maintenance agreement, GeoComm will maintain the Network Routing Dataset used in the GeoLynx software system. To support accurate routing, the Network Routing Dataset must be rebuilt each time there is a software map update involving spatial or attribute changes to the road centerline layer.

Prior to updated GIS map data being provisioned into the system, GeoComm will:

- Review and make necessary updates to routing attribute fields in the road centerline layer (oneway, speed, distance, minutes)
- Check road centerline topology
- Rebuild the Network Routing Dataset using ArcGIS Network Analyst for Desktop

These updates will be completed on a regular basis, but no more frequently than monthly.

Once complete, GeoComm will provide the GIS data back to Keith County, along with an updated Network Routing Dataset, for provisioning into the GeoLynx software system.

GeoComm Deliverables

General Project Support

- Project schedule
- Regular status reports and conference calls

GeoLynx Server Systems

- GeoLynx Server Dispatch Mapping for three (3) positions
- GIS Setup Services
- Surrounding County Data Addition for Cherry County, Nebraska; Cheyenne County, Nebraska; and Sedgwick County, Colorado
- Standard Dispatch CAD Interface
- Routing Functionality
  - Network Analyst Extension for Server license (1)
  - Network Routing Dataset Development Services:
    - Updated road centerline layer with required routing fields added and attributed
    - A network routing dataset
  - Network Routing Dataset Maintenance (at a maximum of monthly):
    - An updated road centerline layer with required routing fields added and attributed
    - An updated network routing dataset
- 9-1-1 Call and CAD Incident Viewing in GeoLynx Server
- Onsite installation, configuration, and training
- Acceptance test plan
- Five years of software support and maintenance services

Exhibit B – Customer Responsibilities

We believe our clients play a critical role in a project's success. While GeoComm will lead the project efforts, we will partner with you to ensure you have in-depth project knowledge and are kept informed about the project status and meeting project goals.

Keith County Responsibilities

It is requested that Keith County provide the following general project support:

- Assist in coordinating and attend periodic conference calls
- Provide pertinent project information and documentation
- Assist in ongoing quality control
- Provide a single point of contact at Keith County available for communication throughout the project and system implementation
- Assign appropriate staff to attend the training courses provided
- Have standard IT procedures in place including disaster recovery, system backups, etc.
- Keep and maintain backup copies of current software and current map data files
- Provide a projector for use during all onsite training
- Submit required GIS information (e.g. GIS map data, public safety databases, and/or other resources) to our website (*http://www.geo-comm.com/data-submission*).

In addition to the requirements above, Keith County will be responsible for the following project-specific support:

GeoLynx Server Network and Hardware Requirements

- Provide an Internet connection with a minimum speed of 15 Mb/sec symmetrical to serve the GeoLynx Server website to external site users.
- Provide an Intranet connection with standard speed(s) of 10/100/1000 Base-T Mbps to serve the GeoLynx Server website to internal site users.
- If multi-agency, ensure all PSAPs are connected on a Wide Area Network (WAN).
- Make remote connections available on the provided system servers for on-going technical support of GeoLynx Server.
- Remote connections for initial software and data loading, configuration, and testing must be made available on the system servers or hardware. Alternatively, Keith County may ship the hardware to GeoComm for loading, configuration, and testing.
- Procure, install, configure, maintain, and support one (1) Barracuda Load Balancer, model 340.
- Procure, install, configure, maintain, and support two (2) dedicated web servers meeting the minimum specifications below. GeoComm will implement a license of GeoLynx Server on each server in an active/passive-type architecture. One server will be primary and the other used in a backup capacity only.

System Component	Minimum	Recommended
Form and Factor Location	Rack mount server in a secured server room	

System Component	Minimum	Recommended
CPU Form Factor	Single chip with 4 cores (quad core)	
CPU Clock Speed	**1.8 GHz or higher**	**2.8 GHz or higher**
CPU SPEC Rate	SPEC rate of 35 per core or higher	SPEC rate of 45 per core or higher
	Note: SPEC rate is set by an independent organization that evaluates CPU performance. To search for the SPEC rate of a CPU, go to: http://www.spec.org/cgi-bin/osgresults?conf=rint2006. The number to look at is called the "SPECint®_rate2006" and divide by 4 (for the number of cores) to compare it with the minimum and recommended rates above.	
RAM	**12 GB or more**	**24 GB or more**
Hard Drive Capacity	3x250 GB or larger in RAID 5 array Note: Partitioned as a single partition. Consider disk space not only for GIS and aerial data, but also for geographical area covered by map caches. An estimated 40 GB is dedicated for ArcGIS Server, GeoLynx Server, and GeoComm database components.	
Hard Drive RPM	**7,200**	**10,000 or 15,000**
Hard Drive Interface	SATA	SAS
Display	**1024x768 resolution**	
Graphics Card	8 MB integrated graphics card or higher	
Operating Systems	**Windows Server 2016 Standard x64** **Windows Server 2012 R2 Standard x64** **Note: ArcGIS for Server requires 64-bit OS.**	
Virtualized Environments	Windows Server 2016 Standard x64 Windows Server 2012 R2 Standard x64 Note: ArcGIS for Server requires 64-bit OS.	
Virtualized Software	**VMware ESXi**	
Network	Dual gigabit NICs or better with failover capabilities configured in a failover group	
Internet Connection Server-Side	15 mbps per 10 expected connections (symmetric) Note: VPN connections are not officially supported	50 mbps per 10 expected connections (symmetric)
Internet Connection Client-Side	1.5 mbps Note: VPN connections are not officially supported	5 mbps
Serial Ports	**Serial port if also using your server as a GeoLynx Message Switch computer**	
Optical Drive	DVD+-RW	
Backup	**Offsite tape or hard drive backup solution**	

System Component	Minimum	Recommended
Web Browser	GeoLynx Server is fully tested and supported against Microsoft Internet Explorer 11. Browsers such as Mozilla Firefox and earlier versions of Internet Explorer and Google Chrome may be compatible but have not been tested. Microsoft Edge, Google Chrome 45 and higher, and mobile (smartphone/tablet) browsers are not supported.	

Note: Disk space should be considered for not only GIS & aerial data, but also for the geographical area covered by map caches. An estimated 40 GB will be dedicated for ArcGIS Server, GeoLynx Server, and GeoComm database components.

GeoComm applications cannot be installed on a primary domain controller or a backup domain controller. The server name cannot include a "_" in the server name.

System requirements are current at the time of document drafting. Requirements are subject to change. Please contact GeoComm Technical Support to obtain the latest system requirements.

GeoLynx Server Client Hardware Requirements

- Provide client workstations meeting the minimum requirements below. The workstation should be accessible 24/7. GeoComm applications cannot be installed on a primary domain controller or a backup domain controller.

System Component	Minimum	Recommended
CPU	2.2 GHz dual core or higher	2.5 GHz dual core or higher
RAM	2 GB RAM or more	4 GB RAM or more (3 GB RAM for XP only)
Display	17" monitor, 1024x768 or higher, 24- or 32- bit color depth	17" or 21" monitor, 1280x1024 or higher, 24- or 32-bit color depth
Video Card	32 MB integrated video card	512 MB discrete memory video card with OpenGL 2.0 support
Operating System	Vista Business & Ultimate (32 bit & 64 bit), Windows 7 Pro, Enterprise, & Ultimate (32 bit & 64 bit), and Windows 10 Enterprise (64 bit)	
Web Browser	GeoLynx Server is fully tested and supported against Microsoft Internet Explorer 11. Browsers such as Mozilla Firefox and earlier versions of Internet Explorer and Google Chrome may be compatible but have not been tested. GeoLynx Server is not compatible with Google Chrome 45 and higher, and mobile (smartphone/tablet) browsers are not supported.	
Network Card	10/100 Mbps	1 Gbps
Remote Access	High-speed Internet connection 1.5Mbps	High-speed Internet connection 5 Mbps

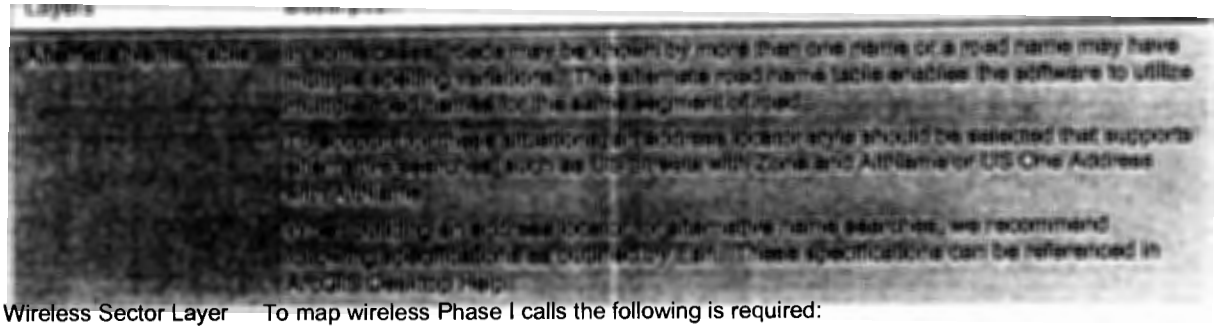
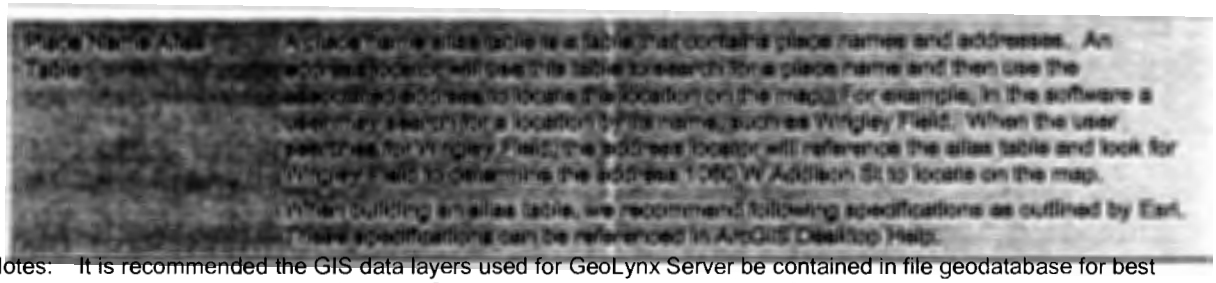
Note: Some antivirus software can cause sporadic issues with the map fully rendering on the screen, which is observed by the user as blank squares. Please contact your system administrator for more information.

GeoLynx Server GIS Requirements

- Provide GIS data meeting GeoLynx Server map data specifications, including information regarding coordinate system/projection to enable 9-1-1 call plotting.

GeoLynx Server required GIS data layers and descriptions of each are in the table below.

Layers	Description
Required Map Data Layers	
Roads Layer (polyline)	Minimum attributes including: MSAG-valid road names, street ranges, and left and right Emergency Service Number (ESN). Road names in either a concatenated in a single field or parsed out. Important: Extra spaces and punctuation should be removed from all data fields. Important: <Null>'s must be removed from all data fields. Important: Road names must be in upper case letters. Important: Road name information in parsed fields must match comparable information in the concatenated field when both are present. Recommended that address ranges are broken down into four fields: Fromleft, Toleft, Fromright, Toright. The following routing attributes are required for network routing functionality: • Oneway (Text (2)) - Number of directions of traffic (FT or TF, N, any other alpha value(s)) • Speed (Long Integer or Text) - Speed limit • Distance (Double) - Length of each road segment (e.g. miles, kilometers, etc...) • Minute (Double) - Estimated drive time in minutes based on segment length and assigned speed limit Important: It is recommended that roads be broken at "true" intersections, boundaries, and emergency service zones. It is also recommended that each road segment does not exceed one mile in length
Emergency Service Zones Layer (polygon)	**Minimum attributes must include emergency service number, fire responder, law responder, and medical responder broken into four fields.**
Political Boundaries Layer (polygon)	Recommended that datasets with more than one jurisdiction have political boundaries all on one layer. Two separate fields are required. One attributed with community name and the other attributed with unique codes depicting individual jurisdictions for color rendering and setting zooming levels.
Address Locator(s)	**Address locators define the process for finding address locations and map features based on a variety of different reference data, such as streets, parcels, address points, etc. At a minimum, a single address locator is required for plotting addresses or locations on a roads layer or other primary search layer.** **GeoComm recommends a refining zone be used with the selected address locator style but is not a requirement. For refining attributes, GeoComm recommends an ESN or MSAG-valid community name.** **GeoComm recommends the naming convention reflect if the address locator is for a point or polygon layer and whether or not a refining zone is included as an attribute.**
Other Map Data Layers	
Site/Structure Layer (Point or Polygon)	**The house number must be in its own field.** **The road name can be concatenated in a single field or parsed out.** **The road names should be capitalized and extra spaces should be removed.**
Label Layers	

Layers	Description
	
Wireless Sector Layer (Polygon)	To map wireless Phase I calls the following is required: • A wireless sector layer containing polygon features depicting the coverage area of the sector. • The layer file name must be called "cell_l" and include minimum fields such as unique id and wireless carrier information. It is required that attribute data be capitalized. Note: The wireless mapping functionality can be implemented only after a wireless 9-1-1 network has been established by the wireless carriers and the PSAP is receiving Phase I wireless E9-1-1 calls.
	

Notes: It is recommended the GIS data layers used for GeoLynx Server be contained in file geodatabase for best performance. However, GeoLynx Server also supports shapefile, ArcSDE geodatabase, and personal geodatabase formats from release 9.3 or higher.

At the time of software setup, GeoComm's GIS personnel will provide our detailed GIS map data specifications. These specifications will provide the layer-by-layer, detailed description and file structure requirements. Ultimately, the quality and availability of the map data provided will directly affect the functionality of the software.

The GIS data layers can be in any coordinate system or projection supported by the Esri projection engine (State Plane, UTM, etc.), as well as any geodetic datum. If a custom coordinate system is used, the .prj file will need to be supplied to GeoComm for review/verification of use within the GeoLynx Family of Products. It is recommended all map layers be in the same projection. However, the GeoLynx Family of Products does have the ability to display map data layers in different projections.

In addition to these GIS data layers, there is no set limit on the number of other GIS data layers that can be integrated into the map display setup.

GeoLynx Server Dispatch Mapping

- To plot calls in GeoLynx Server, provide RS232 serial feed from E9-1-1 ALI controller CAD ports to the GeoComm ALI Connect application. If a virtual server environment is employed, an additional requirement is to provide the necessary hardware or software to convert the RS232 serial feed to an Ethernet / IP output. The ALI controller CAD ports must export fixed format space delimited NENA standard 9-1-1 ALI records for all answered 9-1-1 calls. The CAD ports should be configured as outlined in documentation to be provided by GeoComm.

Network Routing Dataset Development

- Provide the road centerline layer to be used in GeoLynx Software
- Ensure the road centerline layer is free of topology errors.
- Provide hard copy or digital resources depicting the location of one-way streets, speed limits, and any roads that should be excluded from the network for routing purposes. If detailed information regarding speed limits for each street segment is unavailable, an estimated value determined by Keith County may be added for each segment. For example, if the road centerline currently contains road codes based on road type, GeoComm can change all road code 1's to a specified speed, all road code 2's to a specified speed, etc.
- Establish an ongoing maintenance plan for the network routing dataset. The network dataset and associated centerline layer may be maintained by GeoComm as part of a GIS Maintenance agreement, or by Keith County with ArcGIS for Desktop (Standard or Advanced) and the Network Analyst Extension for ArcGIS for Desktop.

Note: ArcGIS for Desktop (Standard or Advanced) and the Network Analyst Extension for ArcGIS for Desktop are required to edit the routing network.

Standard Dispatch CAD Interface

- Purchase the Standard Dispatch CAD interface from GeoComm.
- CAD Vendor, database vendor, or Keith County's IT staff must either:
  - Make the necessary CAD database accessible to GeoComm by way of Microsoft SQL Server database or view within the CAD database. Or,
  - Provide GeoComm with an ODBC connection to the CAD database, including drivers, connection detail, and credentials
- Install, configure, maintain, and support one workstation computer meeting the specifications listed below to act as the system server.

System component:	Minimum:	Recommended:
CPU	2.2 GHz dual core or higher	2.5 GHz dual core or higher
RAM	2 GB RAM or more	4 GB RAM or more
Available Hard Drive	20 GB—depends on size of map data and size of aerial imagery, if applicable	40 GB or more—depends on size of map data and size of aerial imagery, if applicable
Display	17" monitor, 1024x768 or higher, 24- or 32-bit color depth	17" or 21" monitor, 1280x1024 or higher, 24- or 32-bit color depth
Video Card	32 MB integrated video card	512 MB discrete memory video card with OpenGL 2.0 support
Resolution	1024x768 capable video card with 17" monitor, 24-bit color [LCD or CRT]	1280x1024 capable video card with 19" monitor, 32-bit color [LCD or CRT]
Operating System	Windows XP Pro SP3 (32-bit & 64-bit), Windows Business & Ultimate (32-bit & 64-bit), Windows 7 Pro, Enterprise & Ultimate (32-bit & 64-bit), Windows Server 2003 R2 (32-bit & 64-bit), Windows Server 2008 R2 (64-bit)	Windows Server 2012 (64-bit)
Network Card	10/100 Mbps	1Gbps

System component:	Minimum:	Recommended:
Serial Ports	**2 Port DB9PCI Serial Card (Dual com ports) for external connection to 9-1-1 equipment and/or AVL subsystem modems on the server application with the Message Switch.** **Note: PCI serial cards eliminate resources and interrupt sharing problems between multiple ports to be used concurrently.**	
Optical Drive	DVD-ROM Drive	
Modem	**Optional 56 kbps hardware-based fax modem [for faxing maps]**	
Remote Access	Dial-up or high-speed Internet connection	High-speed Internet connection

Network	• **TCP/IP Protocol installed, static IP address assigned**
	• **10/100/1000Base-T Network Interface Adapter**
	• **10/100/1000Base-T switch for connecting workstations**
	• **Network speed requirements depend on usage:**
	  • **10Base-T: suitable for message switch operations and periodic scheduled file update processes**
	  • **100/1000Base-T: suitable for message switch operations and frequent periodic scheduled file update processes, as well as live access of GIS data from a server.**	

Note: Some antivirus software can cause sporadic issues with the map fully rendering on the screen, which is observed by the user as blank squares. Please contact your system administrator for more information.