



**Dispatch Mapping Services**  
**North Central Texas Council of Governments**  
**RFP # 2020-052**  
**March 30, 2020**

## Contents

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<b>Tab A:</b>	<b>Cover Sheet</b> .....	<b>A-1</b>
	Addendum No. 1 .....	A-2
	Cover Letter .....	A-10
<b>Tab B:</b>	<b>Executive Summary</b> .....	<b>B-1</b>
	Introduction .....	B-1
	Proposed Solution .....	B-2
	Why GeoComm? .....	B-4
<b>Tab C:</b>	<b>Key Personnel</b> .....	<b>C-1</b>
	Overview .....	C-1
	Superior Project Management Oversight .....	C-1
	Experienced, Innovative Project Team .....	C-2
	GeoComm Organizational Overview .....	C-4
	9-1-1 Industry Leadership .....	C-7
	Subcontractors .....	C-10
	Resumes .....	C-10
<b>Tab D:</b>	<b>Technical Proposal</b> .....	<b>D-1</b>
	Solution Overview .....	D-1
	GIS Integration and Simplified End-to-End Solution .....	D-3
	Physical and Cyber Security Measures .....	D-3
	Product Roadmap .....	D-5
	Advanced Technical Support Capabilities .....	D-6
	Commitment to NG9-1-1 .....	D-7
	GIS and Location Innovation Leadership .....	D-8
	Systems Engineering Processes, Configuration Management Controls, and Quality Assurance Processes .....	D-11
	Esri Partnership .....	D-13
	AWS Technology Partnership .....	D-13
	System Network and Hardware Specifications .....	D-16
	Designated Points of Contact .....	D-17
	Scope of Work .....	D-17

	Introduction .....	D-18
	Customer Onboarding Project Phases .....	D-18
	Phase One: Project Initiation .....	D-19
	Phase Two: Project Execution.....	D-20
	Phase Three: Project Closeout.....	D-23
	Phase Four: Ongoing Technical and GIS Support.....	D-23
	Conclusion .....	D-24
	Compliance Matrix.....	D-24
<b>Tab E:</b>	<b>References.....</b>	<b>E-1</b>
	Mid-America Regional Council (MARC) .....	E-1
	Association of Central Oklahoma Governments (ACOG) .....	E-2
	Capital Area Emergency Communication District (CAECD) .....	E-3
<b>Tab F:</b>	<b>Proposal Pricing .....</b>	<b>F-1</b>
<b>Tab G:</b>	<b>Required Attachments .....</b>	<b>G-1</b>



REQUEST FOR PROPOSALS
For
Dispatch Mapping Services
RFP # 2020-052

Sealed proposals will be accepted until 2 PM CT, March 30, 2020 and then publicly opened and read aloud thereafter.

Geo-Comm, Inc.
Legal Name of Proposing Firm

Heather Hoskins Vice President of Finance and Administration
Contact Person Title

(320) 240-0040 hhoskins@geo-comm.com
Telephone Number E-Mail Address

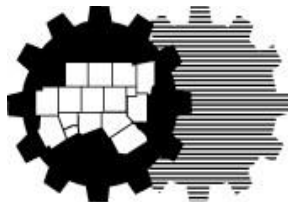
601 West St. Germain Street St. Cloud, Minnesota 56301
Street Address of Principal Place of Business City/State Zip

601 West St. Germain Street St. Cloud, Minnesota 56301
Complete Mailing Address City/State Zip

Acknowledgment of Addenda: #1 x #2 #3 #4 #5

By signing below, you hereby certify that the information contained in this proposal and any attachments is true and correct, and may be viewed as an accurate representation of proposed services to be provided by this organization. You agree that failure to submit all requested information may result in rejection of your company's proposal as non-responsive. You certify that no employee, board member, or agent of the North Central Texas Council of Governments has assisted in the preparation of this proposal. You acknowledge that you have read and understand the requirements and provisions of this solicitation and that the organization will comply with the regulations and other applicable local, state, and federal regulations and directives in the implementation of this contract. And furthermore that I certify that I am legally authorized to sign this offer and to submit it to the North Central Texas Council of Governments, on behalf of said offeror by authority of its governing body.

Heather Hoskins
Authorized Signature



**ADDENDUM TO THE  
REQUEST FOR PROPOSALS  
North Central Texas Council of Governments  
Dispatch Mapping Services**

**ADDENDUM NO. 1**

**DATE ISSUED: March 10, 2020**

**REQUEST FOR PROPOSALS NUMBER: NCT-2020-052  
ORIGINAL RFP SUBMISSION DATE: March 30, 2020  
REVISED RFP SUBMISSION DATE: March 30, 2020 (No Change)**

RFP NCT-2020-052, dated February 18, 2020, is hereby amended to incorporate in full text the following provisions:

**Exhibit A – Erroneous language.**

The final item on Exhibit A that reads *Contractor reserves the right to offer additional mechanical and/or bodywork functions or services at "list less", "Cost plus percent", etc. Please specify* is hereby amended to read ***Contract reserves the right to offer additional products or services not anticipated by this RFP at "list-less" or "cost plus percent", etc. Please specify.***

An updated document is attached to this Addendum.

**Questions and Answers:**

The following questions were submitted by potential proposers and are answered below. Questions are indicated by **bold-face type** and answers indicated by standard type.

**Q: You've made mention that there are 146 PSAPS, while the RFP states there are 176. Can you explain the discrepancy in these two numbers?**

To clarify, we stated 146 call-taker positions, not PSAPs. However, there are in fact 163 active positions, and we stated 176 positions for estimated growth. Note; we cannot forecast the expansion of PSAPs, therefore the 176 number may be exceeded in future years if more positions are added or PSAPs created.

**Q: The RFP contains two bid opportunities, the one for NCT911 and the other for the SHARE Cooperative. My question is, can each bid be provided separately, like if a vendor is interested in only one of them? For instance, the SHARE proposal**

**mentions it can be used Nationwide, but we may only be interested in the Texas regional.**

Vendors should respond to both pricing requirements. The purchasing vehicle that will allow clients to purchase from a contract resultant from this RFP is the anticipated SHARE contract; a Respondent that fails to provide that piece risks their proposal being deemed non-responsive. Being retained as a SHARE Vendor does not obligate one to provide services in geographical areas that they are not interested in, it merely allows them the ability to do so if they so desire.

**Q: So is this like a cooperative purchasing program, like HGAC? Are you trying to create a catalog?**

That's correct, the SHARE Program is a cooperative purchasing program. It is a newer cooperative, but presently boasts a healthy number of contracts that were curated for public sector and governmental agencies, at their request.

**Q: Is NCT9-1-1 looking at awarding multiple vendors, or just one? Or is that determination going to be up to the discretion of the evaluators?**

Although NCT9-1-1 is looking to contract with a single vendor, as part of the SHARE cooperative purchasing program, there is the possibility to award to multiple vendors if this would offer a benefit to other public agencies. The decision is at the discretion of the selection committee depending on the quality of the responses and final scores of the responding vendors.

**Q: Is the intent is to build a cooperative purchasing arrangement? So is this like a DIR only for governmental agencies? Because DIR allows school districts, or things like that to buy as well. The price points in the RFP, are they anticipated to be used as a purchasing vehicle, but scope would be tailored to their individual purposes?**

Yes. Once again, the SHARE Program is a cooperative purchasing program, organized under Chapter 791 of the Texas Governmental Code, just the same as other cooperatives that you may have had experience working with in the past. As such, this contract could be used by any public sector or non-profit agency that had use for it. You're exactly right that the retainer pricing referenced in the SHARE pricing model would allow for the individual tailoring of your services to the requesting entity's needs.

**Q: My question is related to Exhibit A - does have the line item to offer additional services and functions, do we need to label that as Exhibit A-1, or what would be the ideal way to reference this?**

The format that Exhibit A is presented in is a recommended method of supplying pricing information to our Evaluation Committee. More importantly is the adherence to the substance of that item – though you can restructure the pricing table as you desire. As such, you may include the reference to extra items or services on the same

document, though if you would bold, italicize, or otherwise make it known to be separate from your SHARE retainer pricing is preferred.

The intent of that line is for Respondents to submit 'list-less' or 'cost-plus' options for ALL of their other services, or their catalog of products that they would make available to us under this project. In doing so, a Respondent has made their catalog a living document that they can continue to offer goods and service through the life of this contract, at a set rate provided to this RFP.

**Q: Clarifying question on the pricing. Given that the SHARE proposal is the intent to see a unit cost, on the pricing sheets, or combined based on the costs of NCT911, or both?**

Both

**Q: Question I have regards the pricing scoring of the RFP – unit cost vs total in the case that the NCT9-1-1 has a set number of locations. If we present both prices, which will be evaluated?**

Both

**Q: The total position count you've provided for locations, does that include a lab, or only the PSAPs?**

It includes the lab. For clarification; NCT9-1-1 stated 146 call-taker positions, not PSAPs. However, there are in fact 163 active positions, and we stated 176 positions for estimated growth. Note; we cannot forecast the expansion of PSAPs, therefore the 176 number may be exceeded in future years if more positions are added or PSAPs created.

**Q: Going back to the reference of this being a living document, my question is the term of this contract, if it is five years, will groups awarded this contract be able to update it with new products and pricing? Or what is proposed it is what remains in it for five years?**

The answer to this question is dependent entirely on the content that a Respondent provides in their proposal. If they do not acknowledge and respond to the final item on Exhibit A, they are bound to the costs and items only within this RFP for the entirety of the contract's term.

If one were to provide cost-plus or list-less pricing for their catalog, then their catalog is considered captured for the term of a resultant contract, allowing items that are presently not on the catalog today to be added at a later date, and subject to the same cost-plus or list-less pricing discount referenced in the RFP response.

**Q: are SHARE contracts available nationwide or just in Texas?**

SHARE contracts are eligible to be used Nationwide. The agency that desires to utilize a SHARE contract simply needs to hold an Interlocal Agreement with the SHARE Program, which is free to enter into and an evergreen document that never requires renewal.

**Q: Who will be performing the marketing on these contracts?**

SHARE will create a landing page for each Respondent that becomes a SHARE Vendor on the SHARE website, and will always refer interested parties to the contracts they inquire about, but beyond this service marketing is incumbent on the Vendors themselves.

**Q: What was the fee?**

Two percent on all sales.

**Requirement 5.5.1 Item 22: "Ability to integrate Esri and non-Esri formatted data from IoT devices provided through the data center on the private network."**

**Q: Please provide a sample of IoT device types or interface/gateway specifications for information you would like to see on the map.**

Currently, NCT9-1-1 utilizes Esri's GeoEvent server to manage all IoT feeds, IoT device types include any device with a sensor and a data connection. NCT9-1-1 IoT feeds currently include Waze, and OneRain.

Specifications shall include but not limited to MQTT, CoAP, and HTTP.

**Requirement 5.5.1 Item 25: "Ability to do LoST queries and return a URI."**

**Q: What types of lost queries would NCT9-1-1 like to perform and how would that impact a call takers workflow? i.e.: civic, address validation, geodetic etc.**

The Dispatch Mapping product should have the ability to query the ECRF with all LoST query types based on the NENA i3 specifications.

**Requirement 5.5.1 Item 28: "Ability to display EIDO information."**

**Q: What is the anticipated timeframe in which the Network and CHE provider will be able to supply EIDO?**

NCT9-1-1 is currently working with its industry partners and exact date is unknown.



**Requirement 5.5.5 Diagram; 5.5.5.3 "...the road centerline layer and other mission-critical layers identified by NCT9-1-1 must be updated within one minute of being updated in NCT9-1-1's production GIS environment;" 5.5.5.5 "Critical layers, such as the address location point layer and road centerline layer, must be updated within five minutes of being updated in the NCT9-1-1 production GIS environment and provisioned to a mechanism such as an SI."**

**Q: Regarding the top of the diagram where there is the regional (default) 1-waygearsDispatchMap/ECRF: Is the expectation that the process must get the data to the gears in 1-5 minutes or is the expectation that data goes from the regional (default) to the DispatchMap/ECRF in 1-5 minutes?**

The expectation is to get data from the Regional (Default) to the Dispatch Mapping/ECRF.

**Q: Is the expectation for the system to monitor the process to know when changes are available to be ingested or would this process be scheduled to run nightly?**

NCT9-1-1 is open to options for automatic updates or scheduled updates. However, automated and monitored process is preferable.

**Requirement 5.5.7.2 Additional Services Integration: "Respondent must demonstrate a strategy for geographically displaying text messaging received by the PSAP."**

**Q: How is NCT9-1-1 processing text calls? Using Solacom's integrated CHE or via a third-party app such as a web app?**

NCT9-1-1 is currently utilizing a web-based solution. However, NCT9-1-1 is in the process of transitioning to accept text calls with MSRP natively to the CHE. Please note that section 5.5.7.2 is pertaining to Additional Data Repository.

**Requirement 5.5.7.2 Additional Services Integration: "Respondent must demonstrate a strategy for geographically displaying text messaging received by the PSAP."**

**Q: Is the location information available in the Solacom i3 logging feed or via a different API?**

Current integration is through the Solacom i3 logging feed. The preferred method in the future is with an EIDO through an IDX.

**Q: Is providing a Response to this RFP the sole opportunity to participate in the North Texas SHARE program, or will future NCTCOG/NCT911 RFPs include opportunity to participate through Response to those future requests?**

The North Texas SHARE program is always looking for opportunities to expand its offerings. Although the decision is made on a per-procurement basis, NCTCOG/NCT9-1-1 procurements that are a good fit for cooperative purchase will likely be made available through the North Texas SHARE program.

**Questions from E-mail:**

Question Number	RFP Section Number	Question
1	5.5.1 - 22	<p><b>Provide examples of non-Esri-formatted IoT device data that may be in the future, or is today, provided by the NCT data center network.</b></p> <p>An example is the RapidSOS Clearinghouse. Currently, other feeds include Waze and OneRain feeds that are managed by the Esri GeoEvent Server.</p>
2	5.5.1 - 28	<p><b>Describe any mechanisms (protocols and interfaces) that are employed by NCT9-1-1 today to convey EIDO information to the web-based mapping solution and the functional element(s) that produce the EIDOs.</b></p> <p>EIDO can be conveyed via the i3 logging services. NCT9-1-1 welcomes respondent to describe other conveyance mechanisms to transport an EIDO.</p>
3	5.5.2.1.1 – Map Application Interface	<p><b>Introduction - Describe the "interfacing NG9-1-1-related applications" that exist today at NCT9-1-1, that must integrate with the Common Operating Picture (COP) mobile app. What "NG9-1-1 emerging applications" can benefit from the COP?</b></p> <p>Emerging applications shall include but not limited to 3D and z-axis querying, LoST, and HELD</p>

	queries. Preferred LoST request for responder type is civic address to x,y conversion (reverse geocoding).
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Jessie Shadowens  
NCT9-1-1 Senior Manager

Craig Johnson  
Purchasing Supervisor

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**Proposers: Please acknowledge and return a copy of this Addendum with your proposal.**

COMPANY NAME: Geo-Comm, Inc.

SIGNATURE: *Heather Hoskin*

**NOTE: Company name and signature must be the same as on the RFSQ documents.**

Pricing Format Request Example for Dispatch Mapping Services		Procurement No.:	NCT 2020-052
<b>Proposer Name:</b>			
<b>Notes:</b>	1. <b>This pricing sheet is for Dispatch Mapping services only.</b> 2. Please provide hourly rates for all staff required for any function your firm provides for these services. 3. Use as many lines as needed. 4. Detail any additional information as necessary. 5. Proposers are encouraged to offer additional functions or services as a catalog option. Please provide any additional options your firm can provide with 'list less' or 'cost plus' percentages for pricing. A copy of any catalog services should be included with this response.		
<b>Exhibit A - Cost Proposal for SHARE</b>			
Item	Description	Offered Price	
	Position Title (example: GIS Technician.)	per hour	
	Position Title (example: Project Manager).	per hour	
	Position Title	per hour	
	Position Title	per hour	
	Position Title	per hour	
	Service Fee (if applicable)	flat rate	
	Mileage Fee (if applicable)	\$X per mile	
	Parts	Cost, Cost plus, etc	
	Other		
	Other		
	Other		
	Other		
	<b>Contractor reserves the right to offer products or services not anticipated by this RFP at "list less", "Cost plus percent", etc. Please specify.</b>	_____ %	



March 26, 2020

North Central Texas Council of Governments  
Attn: Craigan Johnson, Purchasing Supervisor | Agency Administration  
616 Six Flags Drive  
Arlington, TX 76011

**Re: Dispatch Mapping Services Request for Proposals RFP # 2020-052**

Dear Mr. Johnson:

Geo-Comm, Inc. (GeoComm) respectfully submits a response to the North Central Texas Council of Government's Request for Proposal referenced above.

The enclosed proposal is for a web-based, cloud-hosted Geographic Information System (GIS) public safety 9-1-1 mapping system. The proposal outlines an approach to successfully implement the standards-based system for the North Central Texas Emergency Communications District (NCT9-1-1). In addition, the proposal includes a submission for the SHARE Cooperative Purchasing Program. The response highlights our nearly 25 years' experience with public safety GIS data and mapping applications, our experience working with NCTCOG and NCT9-1-1, and our commitment to your success. We are an industry provider specializing in public safety GIS and 9-1-1 mapping technology and services for Public Safety.

As a leader in GIS and 9-1-1 mapping for the public safety industry, GeoComm is a well-qualified firm and looks forward to a continued partnership with NCTCOG and NCT9-1-1 in the future. Please do not hesitate to contact me with any questions throughout this evaluation process. I can be reached via email at [rhalterbrand@geo-comm.com](mailto:rhalterbrand@geo-comm.com) or by telephone at (320) 281-2193.

Thank you for your consideration.

Sincerely,

A handwritten signature in blue ink that reads "Ron Helterbrand".

Ron Helterbrand  
Territory Sales Manager

## Tab B

## Executive Summary

### Introduction

The following proposal describes a proven approach to successfully deliver a Next Generation 9-1-1 (NG9-1-1) Dispatch Mapping System to the North Central Texas Emergency Communications District (NCT9-1-1). The proposed web-browser-based solution will be the next generation replacement of the District's existing GeoLynx Server Mapping system. The proposed project approach will accomplish your goals with minimal risk to schedule, budget, and quality.

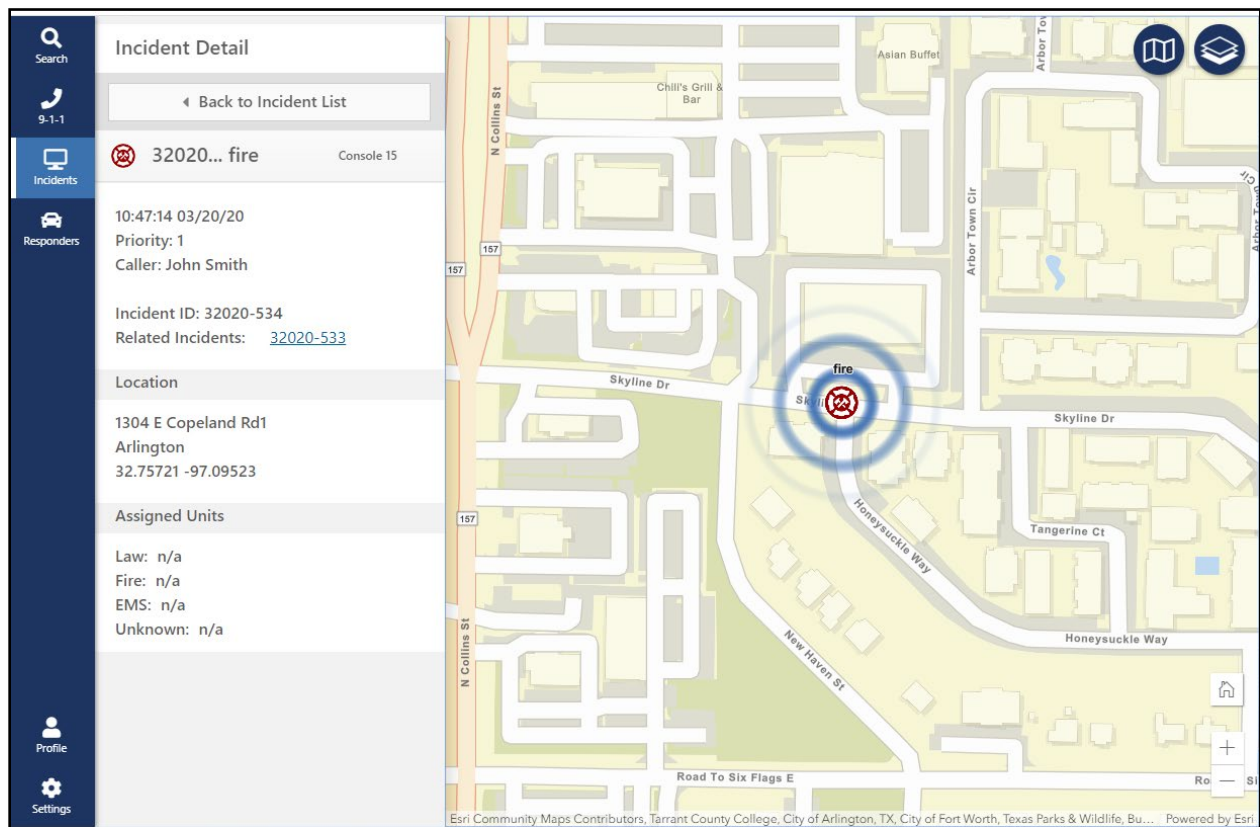
Staying at the forefront of public safety mapping technology by moving to a cloud-hosted mapping solution is a commendable goal for NCT9-1-1. With new technologies come new standards and new challenges. Partnering with a trusted, experienced vendor specializing in public safety Geographic Information Systems (GIS) and mapping technology who will objectively consider the unique needs of NCT9-1-1 will be beneficial in alleviating the challenges which may arise while undertaking your project.

Geo-Comm, Inc. (GeoComm) has carefully reviewed the RFP to understand your goals and system requirements and believe we are best suited to be the trusted partner you need to successfully meet your NG9-1-1 web-based enterprise mapping solution goals. We have provided 9-1-1 mapping solutions for nearly 25 years. In that time, we continually evolve and innovate to meet our customer's needs.

This, along with our nearly ten years of working together with you, uniquely qualifies us to help you meet your goals. GeoComm knows what it takes to work alongside the NCT9-1-1 team, as an extension of your team, to deliver what you require. We have designated a talented team to collaborate with the NCT9-1-1 team to deliver on the project goals. The GeoComm team will be overseen by familiar project leads, Christy Hayes, Director of Project Management, and Todd Pieper, Vice President of Client Services.

## Proposed Solution

The core component to the proposed solution is GeoComm's cloud-hosted mapping solution. The next generation of GeoLynx Server, this solution is designed specifically for 9-1-1 call taking and incident response collaboration. This cloud-hosted, enterprise public safety mapping solution is highly secure, available, reliable, and performant. It is a feature rich solution which provides a real-time picture of 9-1-1 incidents by aggregating data from local and other available sources on a web-based map display. GeoComm offers an optimized public safety map which leverages Esri and AWS technologies.



## Comprehensive GIS Integration

GeoComm sees the big picture of public safety GIS and 9-1-1 mapping solutions. We have purpose-built solutions leveraging that understanding. This means we have designed and built systems that cover the end-to-end GIS and mapping solution needs of our customers. From the moment GIS data is submitted to the system, the process flow for validating the data, preparing it for use in public safety software applications, distributing it to those systems as well as optimizing the public safety user mapping experience is key to how our system operates. Whereas some vendors of cloud-based mapping systems may make map layer hosting someone else's responsibility and cost to bear, GeoComm recognizes that highly available and secure "always on" locally authoritative cloud map layer services are the heart of the solution, and need to be carefully considered.

## **Analytics and Reporting**

For location analytics and reporting, GeoComm proposes an innovative approach that will leverage NCT9-1-1's current ArcGIS Enterprise Portal, or ArcGIS Online organizational account, and current GIS staff capabilities. GeoComm will provide professional services to configure a regionwide 9-1-1 ArcGIS Operations Dashboard that NCT9-1-1 personnel can modify and share with NCT9-1-1 authorized users. GeoComm back-end cloud data processing services will continually process 9-1-1 location data and feed optimized, summarized, and aggregated feature services into your GIS environment to be consumed by the 9-1-1 ArcGIS Operations Dashboard hosted within your own environment.

## **3D Mapping**

With respect to 3D mapping, as part of this proposal, we will provide you with direct access to GeoComm's 9-1-1 Vertical Test Bed ArcGIS Web App Builder application which you can modify with your own custom widgets. There are many unknowns related to 3D 9-1-1 caller positioning as communications service providers work meet new and evolving FCC rules regarding z-axis metrics. Many questions exist around how to best make raw geodetic position measurements such as latitude, longitude, and height above ellipsoid actionable to 9-1-1 call takers. Also, questions exist around how 9-1-1 call takers will interact with 3D maps. GeoComm's 9-1-1 Vertical Test Bed application will enable NCT9-1-1 to study these topics locally, using real 3D 9-1-1 caller locations from providers such as RapidSOS, and using your own 3D mapping data built locally by your team. You will be able to trial 3D 9-1-1 mapping with call takers in your region, and you can decide when the right time to turn on 3D mapping for 9-1-1 will be.

## **Key Account Program**

GeoComm recognizes the knowledge and experience of your staff and look forward to the valuable insight you and your team can provide to GeoComm's continuous product improvement and development process. To that end, we invite you to continue participating in GeoComm's Key Account Program (KAP) to help us maintain a product roadmap that meets your needs and the larger market need as well. GeoComm's established KAP provides a focused collaboration effort between GeoComm and our key accounts. We are excited to have been collaborating with NCT9-1-1 over the last several years in our KAP. With this RFP response, GeoComm proposes to engage NCT9-1-1 during the development of the GeoComm mapping solution beyond the initial delivery. The engagement will have predetermined scope, timeframe, and commitments by both the NCT9-1-1 and GeoComm which are meant to foster a mutually beneficial process of achieving the best outcomes for you, the larger 9-1-1 market, and GeoComm.

This engagement consists of both formal and informal activities in mutually agreed upon timelines. The types of activities which could occur include:

- Feature prioritization input
- User experience discovery and validation
- Early adopter testing
- Collaboration on innovation projects



Formal meetings to review new features and other feedback would be scheduled to occur every month, with GeoComm's discretion to cancel when it is determined a meeting is not necessary. In addition, there would be informal activities which arise based on GeoComm's development iterations where feedback would be sought; these opportunities would be scheduled as needed with at least two weeks' notice.

Based on customer prioritization input, and feature input and feedback, GeoComm will provide confidential feature roadmaps as they evolve. A key component of this engagement is product evaluation by representative end users at different phases of the product release timeline.

Beyond the opportunity described above, participation in the KAP as a GeoComm mapping customer opens opportunities for innovation and research projects around 3D mapping, z-axis, and other mapping related innovations.

Finally, as part of the commitment from customers participating in the program, they agree to provide testimonials in numerous media forms, including text, pictures, and videos for use in print, as well as online social media. Further, GeoComm may ask the customer to be an official reference to others.

## Why GeoComm?

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GeoComm proudly boasts nearly 25 years of experience working with clients to successfully achieve their 9-1-1 public safety GIS goals. Our decades of success speak to our commitment to our customers, being at the forefront of innovating new methodologies to deliver life-saving solutions better and faster than any other vendor and revolutionizing public safety technology solutions delivery. We draw from this unrivaled experience and vision of the future to offer you a best-of-breed, modern, lifesaving NG9-1-1 mapping solution.

In addition, we have a running customer satisfaction rate that is outstanding. We have a 95% retention rate for our mapping customers, with a 100% retention rate for our largest mapping system deployments. Our team is experienced in large, integrated 9-1-1 mapping software implementations, GIS implementation and development projects, and is a leader in providing NG9-1-1 GIS solutions. This experience sets us apart from other vendors.

## Benefits to Working with GeoComm

By partnering with GeoComm on your web-mapping project, you will continue realizing the same benefits you realize by working with GeoComm today. These include:

- Esri platinum partnership providing unprecedented access to support and technology integration design within Esri
- Industry involvement ensuring NCT9-1-1 staff has a resource to answer questions and understand their concerns.
- Certified staff, including AWS certifications, ensuring best practices for implementing and managing the project

- Technology and Engineering team focused on cloud architecture, security and reliability of solutions
- Financial stability ensuring project deliverables and availability of staff
- Ability to scale to customer needs and projects
- Dedicated, experienced executive team guiding the business direction, ensuring customer satisfaction, and understanding the dynamics of the industry

## Unrivaled Public Safety GIS Experience

Further, our public safety GIS experience and expertise far surpass that of any other vendor. Our team of GIS subject matter experts, project managers, consultants, and technicians are the largest in the nation. This will provide you the dual benefit of working with a firm with innovative software and GIS divisions comprised of interdisciplinary teams working tirelessly to ensure we are pioneering new solutions to solve the ever-evolving challenges faced by Public Safety Answer Points (PSAP)s across the nation.

While public safety 9-1-1 GIS is what we have been dedicated to for over two decades, we are mindful of the ever-changing industry and the need to constantly be agile and adaptable. We take pride in being innovative and are never complacent with the status quo. With this mindset, we develop leading edge product and service offerings to make sure our customers exceed their project goals.

## Conclusion

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The following proposal reflects your RFP requirements and underscores our over two decades of industry experience providing GIS for the public safety industry, specifically 9-1-1. The effort we put forth is done with an exclusive purpose: keeping people and their property safe. Our commitment to customers and the people they serve, along with our invaluable experience provides peace of mind not found anywhere else in the industry. This focus is what sets GeoComm apart from other respondents. GeoComm is a deliberate, established public safety GIS innovator. We intend to remain in the industry for another 25 years and beyond.

## Tab C

## Key Personnel

### Overview

GeoComm's ability to exceed your expectations in delivering an NG9-1-1 web-based mapping system will be the result of our nearly 25 years of industry experience, backed by our highly skilled project team who follow formalized project management methodologies. An emphasis on project management and innovation has become integral to our GIS and 9-1-1 mapping project successes. In addition, our team is motivated by the same purpose that motivates 9-1-1 public service organizations nationwide – to help improve our world by supporting emergency response services. This purpose drives us, and you will find yourself working with a team that really cares about the success of NCT9-1-1. With that in mind, we have assembled a project team with experienced industry professionals who are the forefront of developing, deploying, and maintaining 9-1-1 mapping technology solutions and systems. This interdisciplinary team is comprised of staff members from across our organization, many of which you have become accustomed to working with over the years.

### Superior Project Management Oversight

GeoComm's NCT9-1-1 project team will be led by Christy Hayes, PMP, ENP GeoComm Director of Project Management. As NCT9-1-1's current GeoComm Project Manager, Ms. Hayes is known to your project team, and has a longstanding history working with you to successfully deliver on numerous projects throughout the years. Ms. Hayes will continue overseeing your project as the lead GeoComm Project Manager and will receive day-to-day project management support from GeoComm GIS Project Manager, Jessica Frye, ENP. Ms. Frye will utilize her years of industry experience to ensure Ms. Hayes and your project team have the support you need to keep your project on time and within scope and budget. The two Project Managers will provide exceptional project management to ensure a seamless cutover from your existing GeoLynx Server to the new GeoComm cloud-mapping application. Ms. Frye will serve as the primary contact for NCT9-1-1 and Participating Entities, available to you as needed.

The project management efforts will be overseen by GeoComm Vice President of Client Services, Todd Pieper, ENP. They will maintain clear lines of communication both internally and with NCT9-1-1 to ensure any potential impacts to resource availability are identified immediately and mitigated to maintain Ms. Hayes's and Ms. Frye's availability to NCT9-1-1 throughout the project.

Resumes for Ms. Hayes and Ms. Frye are provided in this response starting on page C-11.

## Experienced, Innovative Project Team

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GeoComm will ensure your project is executed and completed with maximum success. The partnership between the NCT9-1-1 and GeoComm professionals in various internal roles will diversify the project team, strengthen the deployment approach with the perspectives of multiple subject matter experts, and ultimately ensure your project is executed on time and within budget by a team of GIS professionals with decades of industry experience.

The experience we have garnered during public safety 9-1-1 GIS mapping projects over the past 25 years gives GeoComm a unique perspective which can be applied to your project for outcomes exceeding your expectations.

In addition to the assigned Project Manager, GeoComm's project team is comprised of professionals from within GeoComm who have extensive experience developing and delivering 9-1-1 mapping system implementations. These professionals include:

- Christy Hayes, ENP, PMP – Director of Project Management
- Jessica Frye, ENP – NCT9-1-1 Project Manager
- Todd Pieper, ENP – Vice President of Client Services
- Ryan Thomas – Vice President of Engineering and Technology
- Erik Loberg – Vice President of Product Management
- John Brosowsky – Vice President of Innovation
- Neil Erickson – Technology Director
- Karl Larsen – Senior Product Manager
- Steven Henningsgard – Product Manager
- Chris Nelson – Applications Architect
- Ryan Dammrose – Senior Software Engineer
- Pat Blair – Senior Software Engineer
- Cory Dwyer – Cloud Engineer
- Jodi Wroblewski, PMP – Implementation Manager
- Anita Kask, ENP – Technical Support Manager
- Tom Henrich – Implementation Engineer
- Nathan Ekdahl, ENP – Senior GIS Manager
- Ryan Schrofe – GIS Analyst

As evidenced in their resumes starting on page C-11 of this response, they have amassed a vast wealth of industry expertise and are considered subject matter experts within the industry.

This team will be supported by an internal team of experienced Managers, Training, Implementation, and GIS Specialists along with our technology and engineering team to ensure the project is delivered successfully and exceeds your expectations.

Todd Pieper will be appointed as your project sponsor. As the project sponsor, Mr. Pieper's role will be to:

- Serve as a point of escalation for the project in the event changes need to be made to the project scope, timeline, or budget
- Have the authority to obtain new or additional resources for the project
- Serve as a point of contact to provide support to the Project Manager

The NCT9-1-1 mapping project is an important project for GeoComm. NCT9-1-1 can be assured the project and their needs have the support of our entire executive team, who, as needed, are available to support the project and the efforts of NCT9-1-1. As valued members of our Customer Advisory Council and as part of the Key Account Program, NCT9-1-1 will have the direct support of their KAP executive sponsor, Erik Loberg, Vice President of Product Management, as well.

### **Working with NCTCOG and Participating Entities Project Teams**

GeoComm has worked with NCTCOG on projects and initiatives for more than ten years. Throughout that time, NCT9-1-1 team members have interacted with and collaborated with our team across executive leadership, product management, project management, implementation, training, and support. Further, over that same period of time, we have supported the NCT9-1-1 GIS and technical teams with their initiatives and responsibilities within their jurisdictions. Drawing from this extensive history working together, we will continue to foster this successful, collaborative working relationship with this web-based mapping project. We have successfully worked together on the following projects and initiatives:

- Two GIS map data cleanup projects
- GIS Workflow development
- GeoLynx Server implementation, training, and cutovers and upgrades
- ECRF and LVF implementation and upgrades
- Two pilot projects with NCT9-1-1 and RapidSOS
- Technical support during critical data center moves
- Key Account Partnership with annual and informal, as-needed meetings
- NCT9-1-1 has been an active, engaged member of GeoComm's Customer Advisory Council (CAC) offering strategic insights and direction on the industry and GeoComm's business
- GeoComm partnered with NCTCOG's GIS team and technical team to implement a GeoLynx Server and GeoComm ECRF and LVF test lab for product development and testing by both parties
- NCT9-1-1 has worked with GeoComm Product Management on GIS workflows and has provided input into Next Generation 9-1-1 Core Services (NGCS), GIS Data Hub and GIS tools, as well as 9-1-1 mapping

Further GeoComm delivered joint presentations with NCT9-1-1 at the following national industry trade shows:

- 2017 Esri User Conference and Washington APCO/NENA: *The NG9-1-1 Maintenance Forecast and 3D Mapping – The Future is Closer Than You Think*
- 2017 Esri User Conference – *Real-life Insight to Accurate Indoor 9-1-1 Mapping*
- 2019 Esri User Conference – *Ideas for Enabling Effective Local, Regional, and State-level NG9-1-1 Maintenance*

GeoComm also collaborated with NCT9-1-1 in 2014 on recognitions received for NCT9-1-1 leadership efforts in the public safety GIS industry including the Esri Special Achievement in GIS (SAG) Award and APCO's Technology Leadership Award.

## GeoComm Organizational Overview

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GeoComm is a Public Safety GIS company dedicated to delivering GIS software and GIS data for geographic mapping systems to small jurisdictions and large regional and Statewide 9-1-1 Systems. GeoComm develops, implements, and supports these systems through the Client Services Division and the Technology and Engineering Division at GeoComm.

### Client Services Division

The Client Services Division is made up of five distinct work groups which focus on a specific set of priorities and functions. These five groups are:

- Project Management
- Software Implementation
- Technical Support
- GIS Project Team
- GIS Managed Services Team

Each team is overseen by a responsible manager who reports directly to the Vice President of Client Services, Mr. Todd Pieper. The teams manage their respective disciplines and assign team members to new projects or tasks as required. This cross-team coordination is managed by an assigned project manager from the project management group. Priorities are managed by each team member's direct manager while working with the project manager.

### Technology and Engineering Division

The Technology and Engineering Division is made up of work groups, including:

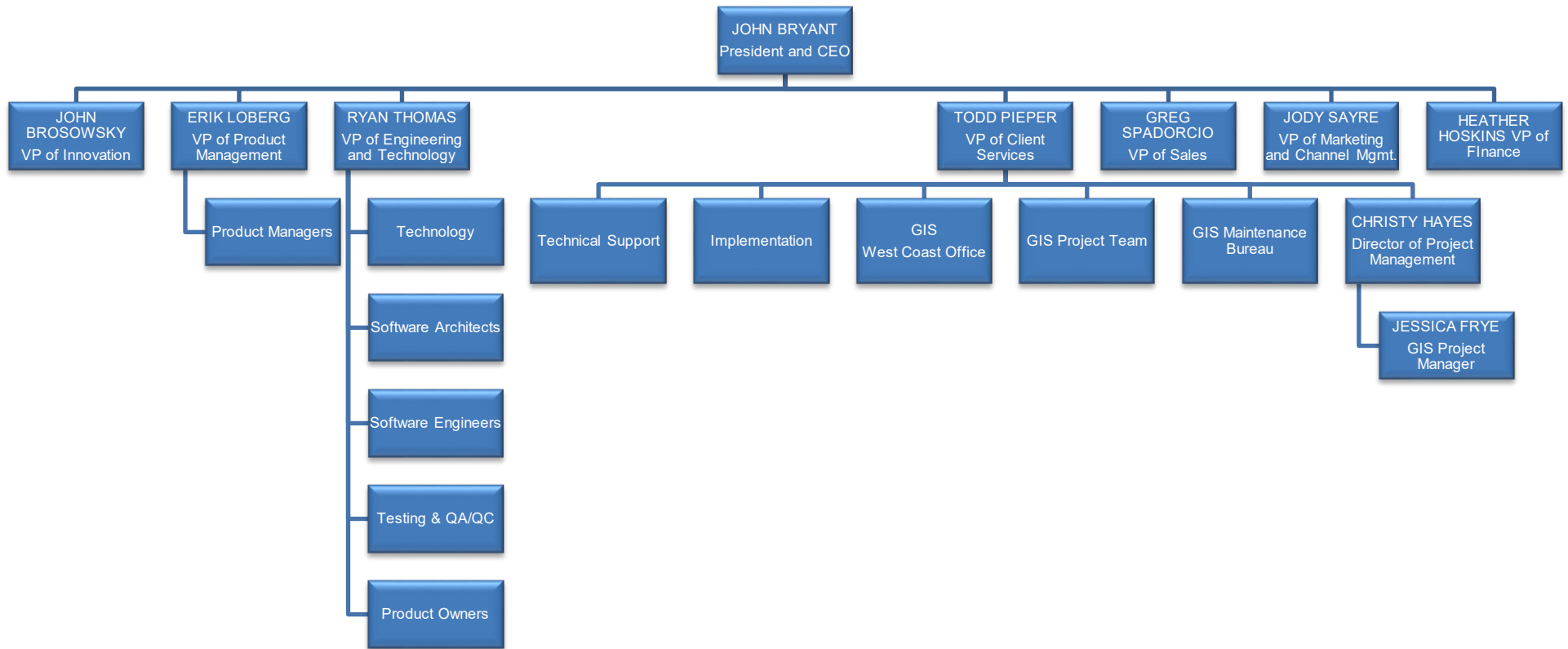
- Technology
- Software Architects
- Software Engineers
- Testing & QA/QC
- Product Owners

GeoComm's Technology and Engineering professionals have a vast depth of experience and expertise in cloud and security technologies, including AWS. The GeoComm security team is responsible for cloud engineering and security. The GeoComm development team includes AWS certified architects and software engineers who work closely with AWS Solution Architects.

Each team is overseen by a responsible manager who reports directly to the Vice President of Engineering and Technology, Mr. Ryan Thomas. The teams manage their respective disciplines and assign team members to new projects or tasks as required. This cross-team coordination is managed by an assigned project manager from the project management group. Priorities are managed by each team member's direct manager while working with the project manager.

### **Organizational Chart**

A chart representing GeoComm's project leadership and reporting responsibilities is provided on the following page.





## 9-1-1 Industry Leadership

GeoComm is actively engaged in industry organizations as members, sponsors, and workgroup participants and leaders. Our focus and commitment to the industry is strong and is evidenced by this continual involvement at a collaborative standards level.

### 9-1-1 Industry Associations Involvement

We are actively involved in the following 9-1-1 associations:

Association/Influencers	GeoComm Involvement
Association of Public Safety Communication Officials (APCO)	Participation as an exhibitor and presenter at the annual conference. Attendance at the Emerging Technology Forum. GeoComm staff members serve on State Level Executive Boards and function as the Chapter Commercial Advisory Member (CCAM).
Esri	In March 2011, GeoComm became an Esri Platinum Tier Partner. Platinum Tier Partners, the highest of three tiers in the partner network, are recognized for developing and delivering industry-leading GIS solutions and services on the ArcGIS software platform.  As a Platinum Tier Partner, GeoComm maintains a high level of collaboration with Esri and allows us to be involved with the direction for their future product development.  Through the Esri Platinum Partner, GeoComm is involved with the Esri Partner Conference, Esri User Conference, Business Partner Conference, Developer's Conference, National Security Public Safety Summit, Technical and Business Meetings, Regional GIS meetings, and CTO Committee.
iCERT (Industry Council for Emergency Response Technologies)	GeoComm has been an iCERT member since 2009. GeoComm serves on the Innovation and Technology Committee. In addition, through our involvement in iCERT, we support efforts to: <ul style="list-style-type: none"> <li>• Assure adequate funding for 9-1-1</li> <li>• Conduct scientific research which benefits the public by implementing improved emergency response technology</li> <li>• Bring together industry leaders to maximize the value of research and development investment</li> <li>• Represent the industry before the public and governmental bodies</li> <li>• Work with officials from organizations such as the NENA, National Association of State 9-1-1 Administrators (NASNA), and APCO</li> </ul>
NENA (National Emergency Number Association)	<ul style="list-style-type: none"> <li>• NENA member</li> <li>• NENA Next Generation Partner Program member</li> <li>• Participation as a presenter and attendee of NENA's 9-1-1 Goes to Washington, Joint committee meeting, and Standards and Best Practice Conference</li> <li>• Participation as an exhibitor and presenter at the annual conference GeoComm has participated in, tested software, led, and co-organized multiple NENA sponsored Industry Collaboration Events (ICE).</li> <li>• Member of several past and current NENA workgroups, including:</li> </ul>

Association/Influencers	GeoComm Involvement
	<ul style="list-style-type: none"> <li>○ Site Structure Address Point Workgroup Participant</li> <li>○ GIS Data Stewardship for NG9-1-1 Workgroup Participant</li> <li>○ GIS Stewardship for NG9-1-1: Road Centerlines WG Participant</li> <li>○ DM-GIS Stewardship for NG9-1-1 Emergency Service Boundaries Co-chair</li> <li>○ PSAP Logistics – Request for Proposals Co-chair</li> <li>○ GIS Data Transition Co-chair</li> <li>○ ECRF/LVF Workgroup Chair</li> <li>○ Additional Data Workgroup Co-chair</li> <li>○ GIS Data Model for NG9-1-1 Workgroup Participant</li> <li>○ NG9-1-1 GIS Data Model Standard v.2 workgroup co-chair</li> <li>○ NG9-1-1 PSAP Systems Workgroup Participant</li> <li>○ NG9-1-1 i3 Architecture Workgroup Participant</li> <li>○ NG9-1-1 Management Considerations for Emergency Incident Data Document (EIDD) Interoperability Joint NENA/APCO Workgroup Participant</li> </ul>
NG9-1-1 Institute	GeoComm is a Bronze NG9-1-1 Institute Supporter. GeoComm attends the Technology Showcase and 9-1-1 Honor Awards and serves on the Events Committee.
NSGIC (National States Geographic Information Council)	GeoComm is a Gold NSGIC Sponsor. GeoComm has worked with NSGIC to provide educational webinars to the NSGIC membership and attends the Annual Conference, Midyear conference, and serves on the NG9-1-1 Committee.
URISA (Urban and Reginal Information Systems Association)	GeoComm attends and presents at the GIS-Pro Conferences. In addition, GeoComm has several staff members that serve on the NG9-1-1 Task Force. GeoComm is also working with URISA membership to create a workshop for the URISA GIS Pro 2020 conference that will address NG9-1-1 GIS topics such as addressing, industry standards, jurisdictional boundaries, and more.

GeoComm’s industry association participation extends nationwide and into nearly every state NENA and/or APCO chapter. This broad participation provides us with not only specific local understanding but allows us to synthesize a picture of GIS data requirements nationwide.

Specific to Texas, GeoComm is involved with:

- Texas Natural Resources Information System (TNRIS) - GeoComm has been an exhibiting sponsor of the TNRIS GIS forum for the past five years. As a part of the relationship, GeoComm and TNRIS have worked closely in sharing data and information related to GeoComm’s ongoing CSEC project for rural Texas Regions.
- Texas Public Safety Conference – GeoComm is a regular presenter, exhibitor, and sponsor for the conference.
- Sponsor of the NCT9-1-1 Awards Gala
- Planned participation in the 2020 NCT9-1-1 Early Adopter Summit

## Professional Certifications

GeoComm’s commitment to the industry and to NG9-1-1 is also evidenced in our commitment to having team members trained and certified as Emergency Number Professionals (ENPs), GIS Professionals (GISP), Project Management Professionals (PMP), and AWS certifications through Amazon. These certifications further enhance the unrivaled industry experience GeoComm brings to each project.

The following table depicts certifications held by GeoComm staff.

Staff	ENP	GISP	PMP
Jessica Frye	X		
Jessica Beierman	X	X	X
Matt Besser	X		
Gina Cornelius			X
Nathan Ekdahl	X		
Brianna Furey		X	
Stacen Gross	X		
Christy Hayes	X		X
Ron Helterbrand	X		
Anita Kask	X		
Jessica Koenig	X		X
John Krafft		X	
Tuan Le	X		
Sean Lehman	X	X	
Dustin Marlow		X	
Heidi Ness	X		
Todd Pieper	X		
Deb Rozeboom	X	X	X
Jodi Wroblewski			X

In addition to the certifications noted above, our staff carries the following Amazon certifications:

- Christopher Nelson – Software Architect: AWS Certified Solutions Architect Associate
- Pat Blair – Senior Software Engineer: AWS Certified Developer Associate
- Ryan Dammrose – Senior Software Engineer: AWS Certified Developer Associate

## Subcontractors

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GeoComm is not proposing to use subcontractors on this project.

## Resumes

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Project team resumes are provided on the following pages.

# Christy Hayes, ENP, PMP

## Director of Project Management

Christy first began employment with GeoComm in 2010. In the time since, she has filled several roles within the organization. Each role has utilized her project coordination and project management strengths. As an Emergency Number Professional (ENP) and a Project Management Professional (PMP), her skills have been applied to projects ranging from a large GIS vehicle tracking project in southern California to the State of Maine's Next Generation 9-1-1 (NG9-1-1) initiative.

As Project Coordinator, Christy assisted with project management to ensure coordination of project documentation and tasks. She served as Assistant Consulting Services Manager where she oversaw GeoComm's communication consulting staff. In this role, she actively participated in all consulting projects, from project strategy and project oversight to the final project report delivery and presentation. Christy was also responsible for ensuring projects were progressing on time and within budget.

Christy has been part of the public safety industry for more than a decade. She has worked for the large Kansas City metropolitan region, Mid-America Regional Council (MARC), where she was responsible for administering program budgets, working with participating agencies in the region, and communicating with vendors. Her experience at MARC, paired with five years of service delivery on Public Safety Communications and GIS projects with GeoComm offers a nice blend of perspective for understanding the needs of the users and executing on project deliverables.

Christy's experience in public safety management includes:

- Project plan and work breakdown structure development
- Project documentation coordination, i.e. completion of report deliverables, PowerPoint presentations, meeting agendas, project status reports, and change requests
- Project timeline and progress monitoring
- Department policies and procedures document input
- Serve as a primary client contact for data collection and other miscellaneous project management services outlined in project scopes
- Develop data collection documents using different modalities
- Managing Federal Department of Homeland Security grants
- Managing administrative aspects of the regional public safety training program serving more than 600 9-1-1 personnel

### Project Experience

- North Central Texas Council of Governments, Texas
- The State of Iowa

### Professional Experience

#### GeoComm | 2010-present

St. Cloud, Minnesota

- Director of Project Manager
- Assistant Consulting Services Manager
- Communications Project Coordinator

#### Mid-America Regional Council | 2002-2010

Kansas City, Missouri

- Public Safety Administrative Coordinator
- 9-1-1 Administrative Assistant

#### Barkley Evergreen and Partners, Inc. | 2001-2002

Kansas City, Missouri

- Executive Administrator to the Chairman

#### Allegiant Bank | 1991-2001

St. Louis, Missouri

- Executive Assistant and Corporate Secretary

#### Allegiant Bancorp, Inc. | 1994-2001

St. Louis, Missouri

- Vice President, Investor Relations
- Assistant Corporate Secretary

### Education

#### Webster University

St. Louis, Missouri

- Coursework in Business Administration

#### Hickey College

St. Louis, Missouri

- Associates Degree, Administrative Assistant Certification

#### St. Louis Community College

Florissant, Missouri

- Coursework in Business Administration

### **Christy Hayes, PMP, ENP**

- The State of Maine
- Commission on State Emergency Communications, Texas
- Lancaster County, Pennsylvania
- Ulster County, New York
- Riverside County, California
- Portland Dispatch Center Consortium, Oregon
- Tarrant County 9-1-1 District, Texas
- Denco Area 9-1-1 District, Texas
- 9-1-1 Association of Central Oklahoma Governments (9-1-1 ACOG)
- Iowa Statewide Interoperable Communications Systems Board

### **Memberships, Committees, and Certifications**

- Government Training Institute Supervisor Certificate Program
- Current member of Project Management Institute (PMI) and Kansas City, Missouri chapter member
- Certified Project Management Professional (PMP) through PMI.
- Current member of NENA and Emergency Number Professional (ENP)

# Jessica Frye, ENP

## NCT9-1-1 Project Manager

Jessica has immense project experience specific to public safety, GIS and NG9-1-1. Jessica has seven years' experience in GIS project management, sales and program management in the private sector, and over a decade of experience in implementation and management of public safety GIS services in the government sector. She served on the Governor appointed Kansas 911 Coordinating Council from June 2011 to December 2012 establishing the Council's GIS Subcommittee to focus on preparing jurisdictional GIS data for NG9-1-1.

Additionally, Jessica also served as the GIS Coordinator for the Kansas Adjutant General's Department managed multiple departmental, statewide and regional projects for homeland security and emergency management, and supported numerous local, state, and federal emergency response efforts.

Jessica's experience includes:

- Coordinating and supervising over 100's of ArcGIS-based, public safety GIS projects
- Developing and implementing GIS data standards for E9-1-1 and NG9-1-1
- Developing and documenting workflows, standard operating procedures, and guidelines for customers
- Ensuring GIS data quality control standards are met
- Efficiently managing the progress and quality control of new and continuing GIS 9-1-1 based projects
- Creating and maintaining GIS map data for use within Enhanced 9-1-1 (E9-1-1) and NG9-1-1 software programs
- Proficiency in ArcGIS Desktop and Server
- Designing, creating, and maintaining ArcGIS geodatabases

### Project Experience

- Commonwealth of Pennsylvania: GIS Data Standard and Best Practices Development and Commonwealth-wide GIS Data Analysis
- State of North Carolina: NG9-1-1 GIS Data Quality Control, Aggregation, and NG9-1-1 Provisioning
- State of South Dakota: NG9-1-1 GIS Data and Seamless Base Map Project
- State of Iowa: NG9-1-1 Data and Seamless Base Map Project
- Kansas Statewide: NG9-1-1 GIS Data Gap Analysis and Quality Control

### Professional Experience

#### GeoComm | 2016-Present

St. Cloud, Minnesota

- GIS Project Manager

#### Alexander Open Systems | 2012-2016

Overland Park, Kansas

- GIS Design Architect
- GIS Program Manager (Director of GIS Solutions)

#### State of Kansas Adjutant General's Department | 2002-2012

Topeka, Kansas

- Geographic Information Systems Coordinator

### Education

#### University of Toledo

Toledo, Ohio

- Bachelors of Arts; Geography and Planning
- Post Graduate Course Work

### Certifications

- National Emergency Number Association, Emergency Number Professional

### Memberships

- National Emergency Number Association (NENA)
- Kansas Association of Mappers
- Illinois GIS Association
- National Association of Professional Women

### Awards

- Special Achievement in GIS Award – Esri, Inc.
- Women of Excellence Award in the area of Operations – YWCA

# Todd Pieper, ENP

## Vice President of Client Services

Over the past 20 years, Todd has been a respected and valued member of the GeoComm team. Starting as a GIS Specialist, Todd has earned continuous promotions that include four years as Assistant Geographic Services Manager where he managed the day- to-day operations of our GIS staff including developing project estimates and scopes of services. He was the Assistant Consulting Services Manager for over six years where he oversaw projects involving GIS, radio analysis and implementation, radio interoperability, PSAP feasibility and consolidation, and E9-1-1 implementation. During these projects, Todd was an active participant in all client consulting projects from project strategy, to project oversight, and providing assistance to the project team in the delivery of the final report documents and presentations. He was also responsible for ensuring projects progressed on time and within budget. In his achievement of Product Development Manager, he was responsible for assisting the Vice President of Product Development in managing the product development and testing staff, implementing departmental goals, and working with other department managers in achieving customer expectations and projects goals.

In his most recent roll of Vice President of Client Services, Todd oversees the day-to-day activities of the Client Services Department, which encompasses GIS, Software Development, Testing/QA, Technical Services, and Project Management.

Todd's experience in public safety includes:

- Managing departmental communication and interaction with external public safety clients and internal project teams
- Public safety software and GIS project recommendations and proposal development
- Managing professional development for client service team members
- Working with clients and GeoComm team members to manage schedules and ensures project deliverables are met
- Developing and implementing Client Services policy and procedures
- Coordinating and assuring quality of client deliverables
- Project management including interoperable communications analysis and implementation, Software implementation, GIS data development, and analysis for public safety projects
- Reviewing and ensuring quality of public safety communications systems report recommendations
- GIS consulting for address conversion, including developing options and recommendations for a solid GIS dataset for plotting Master Street Address Guide (MSAG)-valid addresses
- Consulting for multi-jurisdictional GIS departments providing options and recommendations for GIS services and ongoing maintenance

### Professional Experience

#### GeoComm | 2000-Present

St. Cloud, Minnesota

- Vice President of Client Services
- Product Development Manager
- Assistant Consulting Services Manager
- Assistant Geographic Services Manager
- GIS Supervisor
- GIS Specialist

#### USDA | 1998-2000

St. Cloud, Minnesota

- GIS Technician

#### Spatial Analysis Research Center, St. Cloud State University | 1998

St. Cloud, Minnesota

- GIS Technician Intern

### Education

#### St. Cloud State University

St. Cloud, Minnesota

- B.S. in Biology
- Minor in GIS

### Certifications

- Certified NENA Emergency Number Professional (ENP)

### Industry Experience

- Public Safety GIS
  - Addressing Projects
  - Readdressing Projects
  - Data Maintenance and Standard Operating Procedures (SOP)and Workflow Development for Public Safety GIS
- Wireless Communications
- E9-1-1 Implementation
- Public Safety Radio Systems



# Ryan Thomas

## Vice President of Engineering and Technology

As GeoComm's Vice President of Engineering and Technology, Ryan is responsible for leading the development and testing of high-quality software solutions on-time, within scope and on-budget, based on market and business requirements defined by the Product Management organization, as well as guiding and overseeing business and product technology strategies. Ryan optimizes results through the effective use of all resources; people, processes and tools, and is a strong leader and people manager, actively engaging individuals and teams to meet or exceed the defined business objectives.

Ryan's professional experience includes:

- Leading software development and quality assurance team members, along with eLearning, IT, and product management
- Leading information technology and remote authentication implementation team members
- Leading information technology team; supervising technology specialist and managing data center and office technology systems
- Leading infrastructure teams; designing and deploying infrastructure to public (AWS and Azure) and private cloud environments
- Developing of all software solutions for external customers
- Developing and Software Quality Control (SQC) functions and all related positions, such as an Architect, Product Owners, Business Systems Analysts, Software Engineers, SQC resources and Technical Writer
- Relevant processes, such as Agile Scrum, Pragmatic Marketing (relevant development related processes) and DevOps
- Ensuring high quality software solutions are delivered within scope, on time and within budget
- Strategic and tactical leadership of the Software Development organization, including architecture, product development and quality assurance
- Driving a common technology platform and evolution across GeoComm's developed software products
- Developing and actively leading high performing teams
- Working closely with colleagues, especially VPs of Product Management and Client Services.
- Implementing and/or utilizing best practices and standardized processes
- Communicating effectively with executive leaders, key customers, and business partners
- Keeping up-to-date on information and technology affecting functional area(s) to increase innovation and ensure compliance

### Professional Experience

#### GeoComm | 2018-Present

St. Cloud, Minnesota

- Vice President of Engineering and Technology
- Vice President of Software Development

#### Hoonuit | 2008-2018

Little Falls, Minnesota

- Senior Director of Product Engineering
- Interim Chief Operating Officer
- IT/Network Security Manager
- Network Security Analyst

#### Stearns Financial Services, Inc. | 1997-2008

St. Cloud, Minnesota

- Network Engineer

#### Stearns Bank Equipment Finance | 1997-2002

St. Cloud, Minnesota

- Systems Administrator/Trainer
- Client Relations Specialist

### Education

#### North Dakota State University

Fargo, North Dakota

- Master of Software Engineering

#### University of Northwestern

St. Paul, MN

- B.S. in Communications/Media Technology

### Certifications

- Microsoft Certified Professional – Office 365
- Software Engineering

# Erik Loberg

## Vice President of Product Management

With over 20 years' experience in the public safety market, Erik understands customer challenges and needs from both a sales and product management perspective. As Vice President of Product Management, Erik is responsible for the overall strategic product vision for GeoComm products and solution offerings. Working with a team of Product Managers, Erik's primary role is to drive the GeoComm's overall strategic product direction through understanding business problems and opportunities of market segments. Erik, in conjunction with the product management and business development team, seeks out new market opportunities by identifying market gaps in current product offerings while developing technical and functional specifications for new product proposals.

Erik has proven success in product management, business development, sales management, and channel development. He has proven leadership ability with success in building strategic plans, developing and managing teams, creating and strengthening customer relationships, gaining cross-departmental consensus and support, and communicating at the executive level.

Erik's professional experience includes:

- Defining new positions and developing strategic objectives
- Successfully managing consistent top line revenue and EBT growth
- Implementing Pragmatic Marketing principles into product line management group; gained consensus of product development in support of principles
- Designing and implementing various product quality improvement initiatives (including GATE processes), resulting in increases in control, throughput, quality, and effective internal/external communications
- Implementing new Feature Enhancement Request web-based tool to capture, track, and manage feature requests
- Developing and implementing executive level reporting tools covering product sales, product line revenues, and development project budgets
- Establishing process to track and report on project costs from original Estimate of Effort through actual development for financial analysis at appropriate GATE checkpoints
- Leading cross-departmental effort in redesigning company processes in preparation for new product launch
- Negotiating contracts with and managed third party vendor company relationships
- Developing third party company evaluation process and standards to measure potential solution providers and insure conformance with company's quality, warranty, and support objectives and standards

### Professional Experience

#### GeoComm | 2016-Present

St. Cloud, Minnesota

- Vice President of Product Management
- Director of Sales

#### Unify, Inc./Atos | 2015-2016

- Senior Director, NextGen Solutions

#### TriTech Software Systems | 2013-2015

- Director, Product Management CAD and 9-1-1

#### Cassidian Communications, Inc. and EADS North America Company 2011-2013

- Senior Channel Manger

#### Loberg Enterprises, Inc. | 2007-2011

- Senior Channel Manger

#### PlantCML | 1999-2007

- Director of Business Development – Private Safety
- Director of Product Line Management
- National Account Manager

### Education

#### San Diego State University

San Diego, California

- B.S. in Business/Marketing

### Certifications

- Certificate of completion from Pragmatic Marketing: Strategic Role of Product Management, Practical Product Management, and Requirements that Work (2005)
- 280 Group Optimal Product Process

# John Brosowsky

## Vice President of Innovation

John and a team of software developers are responsible for all activities related to GIS software development and GIS hardware aspects at GeoComm. From a national perspective, John has arguably more experience with public safety GIS software research and development than anyone does in the country. John was responsible for the design and installation of the first GIS "Mapped ALI" system in Meeker County, Minnesota during the mid-1990s. This system continues to operate today.

Over the ensuing 23 years, John has overseen the progressive development of public safety GIS software programs resulting in the installation of over 8,500 licensed copies of public safety GIS software in over 700 sites throughout the United States. John has also supervised the design of dozens of customized software interface systems allowing for the integration of GIS data with public safety text data for the purpose of providing spatial context to public safety information for strategic and tactical purposes.

John's experience includes:

- Overall project management, planning, design, and development of GeoComm software products
- Developing strategy and direction for software product vision statements and scopes
- Meeting product version and new version deadlines for all software products
- Coordinating software demos to introduce new products internally and to potential customers
- Managing product design and development from concept through coordination of product launch
- Researching the basis for development of software products and systems
- Developing sales documentation, proposals, sales strategies, and presentations to increase the salability of all products
- Over 20 years of experience in program management and software development with concentration in GIS and public safety applications
- Initially creating, designing, and developing GeoComm's Family of Products including E9-1-1 dispatch mapping, automatic vehicle tracking (AVL), and GPS sensor interface software
- Writing and reviewing technical documentation including white papers, product concept proposal requirements, specifications, flowcharts, diagrams, and user materials that describes how systems operate
- Responsible for the architectural analysis, design, and development of the first prototypical wireless E9-1-1 call mapping software, and spatial 9-1-1 call routing software, ever demonstrated in the United States

## Professional Experience

### GeoComm | 1997–Present

St. Cloud, Minnesota

- Vice President of Innovation
- Vice President of Product Development
- Product Development Director

### Westphal & Associates | 1997–2004

- Independent Contractor for GIS Software Applications Development

*Responsibilities included GIS software applications development and systems consulting for a cadastral mapping consulting company. Implemented and supported COGO mapping tools, Web GIS system, and AS-400 tax and CAMA interface.*

### Intelligraphics International/Analytical Surveys (ASI) | 1996–1998

- Senior GIS Specialist

*Responsibilities included digitizing cadastral maps, telephone utility maps, and gas and electric maps for automated facilities management (AM/FM) GIS systems.*

## Education

### University of Wisconsin

Madison, Wisconsin

- B.S. in Geography Emphasizing GIS and Automated Cartography

### Milwaukee Area Technical College

Milwaukee, Wisconsin

- Continuing Education - Software Development

### Esri System Design Workshop

St. Cloud, Minnesota

- System Architecture Design Strategies Three Day Training

### St. Cloud State University

St. Cloud, Minnesota

- Continuing Education – GIS

## John Brosowsky (continued)

- Providing expertise in developing interfaces that integrate GeoComm software with other external database and real-time systems, such as sensor arrays, Computer Aided Mass Appraisal (CAMA) systems, Computer Aided Dispatch (CAD) systems, and 3-D real-time visualization systems
- Professional presenter and lecturer at national conferences, including NENA and APCO
- Experience in hardware systems including E9-1-1 ANI/ALI controllers, E9-1-1 remote ALI database interfaces, E9-1-1 selective router servers, radio modems, and GPS equipment
- Experience with GIS software applications including ESRI ArcGIS, MapInfo, MapGuide, Manifold, and PostGIS
- Experience with GIS software applications development including ArcObjects, ArcGIS Engine, ArcGIS Runtime, ArcGIS for Server, ArcGIS Server Silverlight and JavaScript APIs, Google Maps, Google Earth, Bing Maps, ODBC, ADO.NET, Access, SQL Server, DB2, Oracle, ESRI Geodatabase, .NET, HTML, SML, SOAP, ASP.NET, AJAX, JavaScript, C#, VB.NET

## Certifications

- Pragmatic Marketing Certification

## Professional Affiliations

- NENA member

## Highlighted Projects

- Responsible for the analysis, design, and development of the first live operational wireless E9-1-1 call mapping system installed anywhere in the United States in St. Clair County, Illinois
- Provided direction for the development and implementation of a system that utilizes secure Internet technology to publish dynamically updated spatial data to over 45 E9-1-1 call centers with over 250 E9-1-1 call operators, within the nine-county 9-1-1 jurisdiction governed by the Mid-America Regional Council (MARC) headquartered in Kansas City, Missouri
- NENA ECRF/LVF Workgroup Chair

# Neil Erickson

## Technology Director

Neil started with GeoComm as an IT Technician where he was responsible for first line end user support that consisted of new employee user creation and setup in Microsoft Active Directory, CRM, SharePoint, and phone system. He also provided software support for Microsoft Window, Office, and ArcGIS software, and supported Dell and HP laptops and workstations.

Neil's responsibility as Technology Director is the overall planning, organizing, and execution of companywide IT and voice system functions for the company. He has detailed knowledge of hardware and software installation, testing, and operations, and considerable knowledge of LAN/WAN concepts and fundamentals. He maintains the relevancy of IT structure by understanding and anticipating interrelationships within the IT architecture and maximizing resources to ensure continuity and quality of service to end users.

Neil's experience includes:

- Establishing and maintaining effective working relationships with other company personnel
- Performing highly responsible assignments requiring experience, judgment, and discretion
- Ensuring data/system security by protecting company network from unauthorized access, use, interruption or sabotage
- Ensuring data and network structure is backed up and recoverable
- Managing provision of timely staff technology assistance
- Preparing and managing technology and voice system budget
- Creating and maintaining departmental system and procedure documentation
- Providing expertise to GeoComm staff in understanding and implementing IT strategies
- Providing research and managing special technology initiatives
- Managing, budgeting, and implementing VoIP phone system to replace old PBX phone system
- Managing, budgeting, and implementing VMware software, consisting of 6 VMware hosts over 300 VM's and 3 SAN devices
- Developing critical reports using SQL Server Reporting Services for Sales and Management
- Managing, budgeting, and working with outside vendors to implement backup power system for server room
- Managing, budgeting, and implementing the migration to Office 365
- Developing a process for automating deploy workstations and laptops
- Implementing IT Help Desk system, Active Directory, Microsoft Dynamics CRM, Microsoft SharePoint, and Microsoft Dynamics GP

## Professional Experience

### GeoComm | 2005-Present

St. Cloud, Minnesota

- Technology Director
- IT Director
- IT Manager
- IT Technician

## Education

### Central Lakes College

Staples, Minnesota

- Graphic Technician Degree

## Certifications

- Network Support Technician

# Karl Larsen

## Senior Product Manager

As GeoComm's Senior Product Manager for Mapping Solutions, Karl is responsible for defining market requirements and packaging the features and services into product releases that meet market demand and solve user problems. He works closely with the product management team, development/testing teams, and technical teams to provide support with respect to pre-development technical design, product testing, and technical documentation, and is involved in a wide range of technical aspects.

Karl participates in the product development process that occur before software programming projects begin, such as identification of market problems and customer needs, and with researching, qualifying and recommending technologies for solving problems.

Karl's experience includes:

- Managing the creation and prioritization of requirements based on understanding problems observed in the market
- Observing the industry, existing customers, and potential customers to identify common market problems
- Identifying market problems by analyzing existing customer enhancement requests, and by interviewing current and potential customers
- Interacting with potential customers via industry conferences and standards bodies, and by assisting the GeoComm sales force with non-traditional complex system sales
- Working closely with others in product management positions to collectively convey product vision to others in the company
- Communicating the marketable features and benefits as a part of the product launch process post development
- Helping strategically position and evaluate product markets and feature sets
- Providing input to product roadmaps, conduct technology assessments, analyzing competitive offerings, and participating in win/loss interviews
- Creating innovation plans that solve market problems and provide a vision for product positioning
- Validating product and feature direction by collaborating with internal and external customers through the use of mockups, wireframes, prototypes, and applications
- Soliciting feedback and observe customer and stakeholder interactions with the designs or applications
- Sharing and cultivate technical and product knowledge throughout the company
- Interacting closely with product management, development, and testing staff to ensure requirements and technical solutions are well understood
- Communicating knowledge with internal and external customers, including existing or potential customers, sales and marketing staff, and business partners

### Professional Experience

#### GeoComm | 2005-Present

St. Cloud, Minnesota

- Senior Product Manager
- Product Manager
- Software Development and Testing Assistant Manager
- Product Development Coordinator
- GIS Coordinator
- GIS Specialist

### Education

#### St. Cloud State University

St. Cloud, Minnesota

- B.A. in Geography and Minors in GIS and Communications Studies

#### Esri System Design Workshop

St. Cloud, Minnesota

- System Architecture Design Strategies Three Day Training

### Certifications

- Pragmatic Marketing Certification

### Industry Experience

- Karl led the efforts related to pilot testing and supporting RapidSOS Clearinghouse for supplemental caller locations from Google Android and Apple iPhone's in GeoComm's mapping products.
- Karl has been involved with several NENA NG9-1-1 activities including the NG9-1-1 PSAP workgroup Additional Data workgroup and the ECRF/LVF workgroup.
- Manages product life cycle of existing and new GeoComm products.

# Steven Henningsgard

## Product Manager

As a Product Manager, Steve participates in all phases of the product life cycle and is responsible for defining market requirements and packaging the features and services into product releases that meet market demand and solve user problems.

Steve works closely with the product management team, development/testing teams, and technical teams to provide support with respect to pre-development technical design, product testing, and technical documentation. He is involved in a wide range of technical aspects and has extensive knowledge of GeoComm products and services as well as GIS and computer technologies.

Steve's experience includes:

- Managing the creation and prioritization of requirements based on understanding problems observed in the market
- Observing the industry, existing customers, and potential customers to identify common market problems
- Identifying market problems by analyzing existing customer enhancement requests and by interviewing current and potential customers
- Interacting with potential customers via industry conferences and standards bodies and by assisting the GeoComm sales force with non-traditional complex system sales
- Working closely with others in product management positions to collectively convey product vision to others in the company
- Communicating the marketable features and benefits as a part of the product launch process post development
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- Validating product and feature direction by collaborating with internal and external customers through the use of mockups, wireframes, prototypes, and applications
- Sharing and cultivating technical and product knowledge throughout the company
- Interacting closely with product management, development, and testing staff to ensure requirements and technical solutions are well understood
- Communicating knowledge with internal and external customers, including existing or potential customers, sales, and marketing staff

## Professional Experience

### GeoComm | 2014–Present

St. Cloud, Minnesota

- Product Manager
- Software Prototype Developer

### St. Cloud State University Visualization Lab | 2014–2016

St. Cloud, Minnesota

- Software Research Assistant, Intern

## Education

### St. Cloud State University

St. Cloud, Minnesota

- B.S.E. in Computer Engineering, May 2017 (expected)
- National Science Foundation / CESP STEM Scholarship
- Electrical and Computer Engineering Department Scholarship
- American Council of Engineering Companies-MN Scholarship
- Pierce Wikman Memorial Scholarship

## Additional Experience and Awards

- EEE Twin Cities Section Outstanding Student Member Award
- President - IEEE Student Chapter
- First Place - Robotics Competition - IEEE Region 4 Student Leadership Conference
- First Prize & Crowd Favorite - Startup Weekend St. Cloud - "DibsOnIt"
- Volunteer - Boys & Girls Clubs of America

# Christopher Nelson

## Applications Architect

Chris has over 18 years of software architect experience and leading the development of software systems. He has a proven track record working closely with development leads, management, and product management teams to increase cohesiveness and communication across all teams.

As GeoComm's Applications Architect, Chris is primarily responsible for providing technical leadership and mentoring to the Software Development team members which include gaining and maintaining working knowledge of the products and processes from a business and technical perspective; defining best practices and selecting best of breed tools and components and implementing, and enforcing department best practices along with functional leadership and leading the design for new products and components.

Chris' experience includes:

- Cloud computing architecture. Amazon AWS and Microsoft Azure
- Defining and maintaining best practices for software development including design, implementation, process and tools
- Designing software for stability, performance, scalability and testability
- Participating in organizational initiatives to define, measure, and report on application scalability, performance, and stability
- Experiencing working on projects with aggressive timelines and providing time and resource estimates for the projects and directing the efforts
- Ensuring that automated unit testing tasks are completed according to project schedules and release qualification plans
- Researching and development around emerging technologies
- Development of Proof of Concepts to validate new software solutions and/or components
- Quality control testing, structured software testing methodologies and automation frameworks, inclusive of industry standard best practices.
- Executing automation software testing tasks requiring analysis, planning, scheduling, working with various technologies, participating in requirements, and design reviews, etc.

## Professional Experience

### GeoComm | 2018-Present

- St. Cloud, Minnesota
- Applications Architect

### Merrill Corporation | 2004-2018

- St. Cloud, Minnesota
- Software Architect
  - Lead Software Developer

### Wolters Kluwer Financial Services | 2012-2014

- St. Cloud, Minnesota
- Senior Software Engineer

### Remmele Engineering | 2008-2012

- Big Lake, Minnesota
- Senior Software Engineer

### Meyer Associates | 2002-2004

- St. Cloud, Minnesota
- Software Developer

## Education

### St. Cloud State University

- St. Cloud, Minnesota
- B.S. Applied Computer Science
  - Minor in Business Computer Information Systems

## Certifications

- AWS Certified Solutions Architect Associate – 2019
- .NET Framework 4, WCF Service Communication Applications (D519-6672) 10/21/2011
- .NET Framework 3.5, Windows® Presentation Foundation Applications (C962-5900) 6/1/2010
- .Net Framework 2.0, Windows® Applications (C962-5899) 8/6/2008

## Training

- AWS re:Invent Conferences
- Microsoft Build Conferences
- The Project Design Master Class
- Cloud Architecture Master Class



# Ryan Dammrose

## Senior Software Engineer

As Senior Software Engineer, Ryan is responsible for enhancing the company's development effort using a cutting-edge tech stack. Ryan has strong engineering principles and methodical problem-solving skills and is responsible for contributing to development quality, including unit testing, peer review, and other quality activities, as needed, and coaches and mentors other software engineers and team members.

Ryan's experience includes:

- Developing, maintaining, and innovating large scale, consumer facing web or desktop applications
- Being familiar with the development challenges inherent with highly scalable and available web applications
- Having experience with open source technologies and various modern web frameworks
- Developing GIS applications using Esri technology
- 6+ years of experience developing software applications and web services
- Programming experience in C#/.NET/dotnet, JavaScript, TypeScript, HTML/CSS, Java, Python, and Ruby
- Experience designing applications that operate on cloud environments such as AWS
- Working experience architecting and building full-stack SaaS solutions in AWS (e.g. serverless and containerized), including the use of CloudFormation, IAM, S3, WAF, CloudFront, API Gateway, Lambda, DynamoDB, SNS, SQS, Route 53
- Working experience in DevOps and building full CI/CD pipelines, including Octopus Deploy and AWS IAM, CodeBuild, CodePipeline, CloudWatch, SNS, VPC, EC2, Docker, ECR
- Working experience with web frameworks and technologies (e.g. Angular, Redux)
- Working experience with SQL databases (SQL Server, MySQL, PostgreSQL)
- Working knowledge of Git version control and GitHub
- Hands on experience creating responsive web applications using modern frameworks
- Ability to establish priorities and work independently on multiple tasks
- Knowledge of Agile software development methodologies and practices

### Professional Experience

#### GeoComm | 2018-Present

St. Cloud, Minnesota

- Senior Software Engineer

#### PlusOne Solutions | 2017-2018

Boise, Idaho

- Full Stack Software Engineer

#### President of Map Lion, LLC | 2014-2018

- Contracting with PlusOne Solutions
- Contracting with LeapFox Learning
- Contracting with City of Saratoga Springs
- Contracting with Mountain Health Co-op

#### J.R. Simplot Company | 2012-2016

Boise, Idaho

- GIS Programmer/Analyst II
- GIS Analyst

### Education

#### Boise State University

Boise, Idaho

- Master of Earth Science
- Focus on Hydrology, Data Modeling, Computer Science, Mathematics, GIS

#### University of Texas at Arlington

Arlington, Texas

- B.A. in Geology
- Certificate in Spatial Information Systems

### Certifications

- AWS Certified Developer – Associate

# Pat Blair

## Senior Software Engineer

Pat is a motivated and experienced Senior Software Engineer for GeoComm, enhancing the company's development effort using a cutting-edge tech stack. He has a passion for high quality software, and has strong engineering principles and methodical problem-solving skills. Pat contributes to development quality, including unit testing, peer review, and other quality activities, as needed, and coaches and mentors other software engineers and team members.

Pat's experience includes:

- 15+ years of experience developing GIS software applications and web services for public safety using Esri and Open Source technologies
- Developing, maintaining, and innovating large scale, consumer facing web or desktop applications
- Familiar with the development challenges inherent with highly scalable and available web applications
- Experience designing applications that operate on cloud environments such as AWS
- Programming experience in Python, C# / .NET, Java, JavaScript/TypeScript
- Working experience with SQL databases, specifically PostgreSQL as well as document databases
- Hands on experience creating responsive web applications using modern frameworks such as Angular

### Professional Experience

#### GeoComm | 2015-Present

St. Cloud, Minnesota

- Senior Software Engineer

#### Bismarck, North Dakota | 2012-2014

- Contract Software Developer

#### Bullberry Systems | 2004-2012

Bismarck, North Dakota

- Lead Software Developer

#### St. Mary's College of California | 2002-2003

Moraga, California

- Network Analyst/Programmer

#### NativeMinds, Inc. | 1999-2002

San Francisco, California

- Senior Systems Developer/Architect

#### Peet's Coffee and Tea | 1998-1999

Emeryville, California

- Network Manager/Webmaster

#### Disney Direct Marketing | 1997-1998

Burbank, California

- Network Analyst

### Education

#### West Virginia University

Morgantown, West Virginia

- B.F.A. 1994

### Certifications

- AWS Certified Developer

# Cory Dwyer

## Cloud Engineer

Cory is responsible for maintaining cloud infrastructure for GeoComm's cloud hosted software solutions and works with engineering, IT, and client services to build and maintain testing and production environments in AWS. Cory is also proficient in creating technical documentation and diagrams for the company.

Cory's experience includes:

- Planning and implementing solutions for backup and recovery, high availability, key management, and other strategic initiatives
- Writing scripts to automate operations and server management
- Building and maintaining operations tools for monitoring, notifications, trending, and analysis
- Troubleshooting production issues
- Monitoring and optimizing cloud infrastructure health and performance
- Installing operating system updates, hotfixes, patches, and service packs
- Working with software engineers to automate builds and software deployments to testing and production environments
- Ensuring documentation of AWS and configuration processes and policies
- Collaborating with development teams
- Participating in agile ceremonies including planning meetings and system demos
- Providing input on technical requirements for proposals and ensuring compliancy
- Working with departments including technical support to ensure environments and monitoring tools work correctly
- Configuring and maintaining development, staging, and production environments
- Configuring and maintaining network and systems monitoring across multiple datacenters spanning the globe
- Providing support for numerous cloud and managed service clients

### Professional Experience

#### GeoComm | 2020

St. Cloud, Minnesota

- Cloud Engineer

#### Sportradar | 2018-2020

Minneapolis, Minnesota

- Cloud System Administrator

#### Verisae | 2016-2018

Minneapolis, Minnesota

- Senior System Engineer

#### Marco, Inc. | 2014-2016

St. Louis Park, Minnesota

- Tier II Support Analyst

#### Netgain Technology, Inc. | 2013-2014

St. Cloud, Minnesota

- Support Team Analyst

### Education

#### WITC Ashland Campus (UW Technical College)

Ashland, Wisconsin

- A.S. Degree in Computer Networking Technology

#### St. Cloud University

St. Cloud, Minnesota

- B.A Degree in Sociology

### Certifications

- VCA6-DCV

# Jodi Wroblewski, PMP

## Implementation Manager

Jodi started with GeoComm as an Agile Product Owner. In that role, Jodi worked with agile teams developing software applications for the public safety industry and was the liaison between product management and software development. She was responsible for creating a collaborative environment across the entire team including Architect, development team, testing, documentation, and Product Manager.

In her current role as an Implementation Manager, Jodi is responsible in managing resources that are focused on implementation of GeoComm software products, assuring that installation and training services provided by the GeoComm Implementation team are completed in a timely manner and exceed customer expectations.

Jodi's experience includes:

- Managing the daily activities of the Implementation division for projects and employees assigned
- Ensuring project reporting is done in a timely manner
- Providing implementation project management support, assisting Implementation Specialists with more complex projects and customers
- Providing project communication to internal and external stakeholders
- Monitoring the progress of high-profile client projects and ensuring issues are resolved in timely manner
- Guiding development and ensuring training for business partners and VARS
- Assisting in the development and refinement of installation materials and processes
- Assisting with Product Verification (PV) lab development, maintenance, and standard operating procedures
- Ensuring smooth transition of software implementation projects to the support team
- Successfully attaining Key Performance Indicators (KPI)
- Developing and maintaining working knowledge of GeoComm software products
- Developing and maintaining working knowledge of 9-1-1 technologies and standards
- Developing and maintaining a working knowledge of 3rd party software applications used with GeoComm products
- Maintaining technical knowledge of all aspects of how GeoComm products connect in a variety of installation environments to include cloud computing, various computer hardware, software, networking configuration, database technologies, and wireless communications
- Maintaining a working knowledge of client/server operations, ArcGIS Server, ArcSDE, geodatabases, Windows Server, Linux, Docker, SQL Server and other commercial DBMS Platforms, IIS, Active Directory, Network Routing, XML, Web Services, and other related software applications and principles

## Professional Experience

### GeoComm | 2019-Present

- St. Cloud, Minnesota
- Implementation Manager
  - Agile Product Owner

### Netgain Technology | 2016-2018

- St. Cloud, Minnesota
- Director of Client Implementation and Professional Services / Director of Project Management

### St. Cloud State University (SCSU) | 2012-2016

- St. Cloud, Minnesota
- PMO Manager / Project Manager
  - Technology and Marketing Administrator

### ProcessPro Software | 2007-2012

- St. Cloud, Minnesota
- Implementation and Support
  - Project Manager / Account Manager

### Short Elliott Hendrickson (SEH), Inc. | 2004-2007

- St. Cloud, Minnesota
- Assistant Project Manager / Administrative Technician

## Education

### Augsburg College

- Minneapolis, Minnesota
- B.A. in Communications with Public Relations Emphasis

## Certifications

- Project Management Professional (PMP) | 2016
- Data Security Awareness Training and HIPAA HiTech and Privacy | 2016
- Supervisor Development Certificate Program | 2016

## Awards

- Recipient of St. Cloud State University Performance Award 2015 and 2016
- Recipient of MnSCU IT Department Performance Award 2015 and 2016

# Anita Kask, ENP

## Technical Support Manager

Over the past 14 years, Anita has become a respected and valued member of the GeoComm team. Starting as a Technical Support Analyst, Anita excelled at supporting GeoComm customers on the products and was promoted to the Technical Support Manager position in 2009. Anita is responsible for the day to day operations of the Technical Support department which includes 24/7 coverage for emergency situations. Other responsibilities include hiring and training of new staff members, participation on the line of business teams and coordinating case escalations when necessary. She is responsible for ensuring that technical support issues are handled in a professional and efficient manner.

Anita's experience includes:

- Coordinating software and hardware fulfillment processes for the departments, ensuring client support services are delivered in a timely manner and exceeds customer expectations
- Effectively supervises four Technical Support Analysts and directs efforts in their area of responsibility
- Assists with training for all new employees and remedial training as needed
- Assisting customers in troubleshooting, and resolution of system and operational questions and problems regarding GeoComm software and hardware products
- Handles incoming technical support issues from internal and external customers
- Researches and analyzes acquired materials for prompt solutions to technical support issues
- Understanding of various computer hardware, software, networking, configuration, database technologies, and wireless communications
- Preparing and sending upgrade packages to customers by building CDs, creating communications, and shipping packages
- Handling calls or faxes from customers, collecting and analyzing relevant information, and resolving problems in an effective and timely manner
- Documenting process changes, trouble tickets, and reports
- Sharing responsibility for 24 hours a day, seven days a week customer support
- Experience troubleshooting mapping errors with MapInfo and ArcGIS
- Experience with maintenance programming with RPG III, RPGIV, and CL
- Experience with device management such as lines, controllers, workstations, and printers

### Professional Experience

#### GeoComm | 2006-Present

St. Cloud, Minnesota

- Technical Support Manager
- Technical Support Analyst

#### Minco

St. Cloud, Minnesota

- Account Representative
- PC Specialist and AS/400 Programmer

#### Coldspring

Cold Spring, Minnesota

- PC Specialist and AS/400 Programmer

### Education

#### St. Cloud State University

St. Cloud, Minnesota

- B.S. in Business Computers and Information Systems

#### Esri System Design Workshop

- System Architecture Design Strategies Three Day Training | October 2011

### Certifications

- Current member of NENA and Emergency Number Professional (ENP)
- Level 4 CJIS Security Training | February 2019

# Tom Henrich

## Implementation Engineer

Tom's responsibility as an Implementation Engineer is to develop and maintain infrastructure techniques. In addition, he provides technical implementation leadership on large-scale projects, leadership on planned work projects, and general project support. Tom maintains technical knowledge of all aspects of how GeoComm products connect in a variety of installation environments to include the various computer hardware, software, networking configuration, database technologies, and wireless communications.

Tom maintains a working knowledge of SaaS, Microsoft Office applications, PC operations, and other related software applications and principles; including, Esri ArcGIS Server, ArcSDE, geodatabases, AWS services, Linux, Docker, Kubernetes, PostgreSQL, Windows Server, SQL Server, other Commercial DBMS Platforms, IIS, Active Directory, Network Routing, and OSI model.

Tom's experience includes:

- Assisting in the development of system design and implementing infrastructure systems along with maintaining those systems
- Developing best practices for deploying infrastructure systems
- Providing and maintaining documentation on infrastructure systems
- Implementing and deploying of large-scale GeoComm systems and software
- Providing leadership and being responsible for the implementation of planned work projects
- Providing advanced project support to Implementation team members
- Assisting in the development of project documentation including checklists and diagrams
- Providing project communication to internal and external stakeholders
- Ensuring tracking mechanisms are updated as projects progress
- Providing troubleshooting assistance to Implementation and Technical Support team members
- Monitoring the progress of high-profile client projects and ensuring issues are resolved in a timely manner
- Creating, maintaining, and communicating relevant problem project documentation and tracking
- Researching and analyzing acquired materials and delivering prompt solutions to technical issues
- Assisting in testing software releases and related equipment
- Performing remote system maintenance and upgrading services for customers
- Assisting in the development and refinement of installation materials and processes

### Professional Experience

#### GeoComm | 2019-Present; 2006-2015

St. Cloud, Minnesota

- Implementation Engineer
- Implementation Specialist

#### Entrust Datacard | 2018-2019

Shakopee, Minnesota

- Technical Product Support

#### CHS, Inc. | 2015-2018

Inver Grove Heights, Minnesota

- POS Implementation Specialist

### Education

#### Alexandria Technical College

Alexandria, Minnesota

- A.A.S in Computer and Voice Networking Program

# Nathan Ekdahl, ENP

## Senior GIS Manager

Overseeing all GeoComm GIS client projects and service offerings, Nathan provides direct support to a team of public safety GIS professionals recognized as the largest in the United States. He supervises execution of hundreds of GIS NG9-1-1 data cleanup projects ranging from small counties to large state-wide agencies annually as a member of the National Emergency Number Association (NENA) and a certified NENA Emergency Number Professional (ENP).

Nathan's experience in overseeing the development of quality GIS data for emergency environments include:

- Expertise in public safety GIS map data analysis, development, and maintenance management honed over 20+ years of data collection, project management and supervisory experience
- Developing, implementing, and refining GIS QC and fieldwork processes
- Extensive, current knowledge of Esri products
- Overseeing data quality control and data processing procedures
- Reporting to local advisory committees and management teams on on-going projects
- Ensuring processes and procedures are current with the emerging technology
- Managing GIS project schedules to ensure timeliness and quality deliverables

### Project Highlights

- State of North Dakota | State-wide SSAP and RCL Cleanup Project
- Pennsylvania Emergency Management Authority | Region-wide Consulting Services and Analysis
- SIRCOMM, Idaho | GIS Data Cleanup

### Professional Experience

#### GeoComm | 2000-Present

- St. Cloud, Minnesota
- Senior GIS Manager
  - Director of GIS
  - GIS Manager
  - Assistant GIS Services Manager
  - GIS Supervisor
  - GIS Specialist

### Education

#### St. Cloud State University

- St. Cloud, Minnesota
- B.A. in Geography
  - Minor in Community Development

#### Alexandria Technical College

- Alexandria, Minnesota
- A.A.S in Geographic Information Systems

#### Supervisor/Manager Training Program

- St. Cloud Area Chamber of Commerce

### Memberships and Certifications

- Emergency Number Professional
- Participant in NENA Site/Structure Address Points (SSAP) workgroup

# Ryan Schrofe

## GIS Analyst

As GeoComm's GIS Analyst, Ryan is responsible for developing and improving both speed and quality of Public Safety GIS Data Development, GIS Data Analysis, and GIS Data Provisioning processes. Ryan automates processes to validate data integrity and provides technical GIS support. He also responsible for analyzing, interpreting, and understanding results prior to data being implemented into a live 9-1-1 system, and assists on complex projects that include multi-department collaboration.

Ryan also works closely with internal teams and external stakeholders to improve process and to prepare GIS data and associated databases for 9-1-1 systems.

Ryan's experience includes:

- Identifying, researching, and developing methods to ensure GIS workflows are optimized for effectiveness and efficiency
- Working closely with others to analyze current GIS business processes and recommends best practice solutions
- Analyzing, troubleshooting, and resolving GIS application problems
- Communicating with internal and external technical resources to resolve end user issues
- Providing guidance to users on methods for correcting reported problems
- Testing new and revised programs, workflows, and interfaces to ensure accuracy and efficiency
- Developing and working with team members to execute test plans and forwarding to users for user acceptance testing
- Testing and analyzing the effectiveness and functionality of new fields and code
- Notifying appropriate department staff of testing problems and required fixes
- Ensuring functionality of new tools will meet expectations and requirements
- Developing training materials and manuals, and maintaining documentation
- Responding to and resolving user inquiries
- Monitoring the release of new software, software releases, and tools from Esri
- Researching and testing new Esri releases to determine impact on GeoComm services and software
- Training and advising GIS team of required GIS service changes based on Esri service releases
- Completing project work for complex projects for GIS data maintenance, manipulation, analysis, extraction as well as performing data research, investigation, and verification
- Documenting and filing data sources and map files for future reference
- Creating 2D and 3D indoor maps of buildings and stadiums
- Publishing and managing hosted GIS services in AGOL, ArcGIS Enterprise Portal, and ArcGIS Server

## Professional Experience

### GeoComm | 2008-Present

St. Cloud, Minnesota

- GIS Analyst
- GIS Specialist

## Education

### St. Cloud State University

St. Cloud, Minnesota

- B.A. with a major in Geography
- Minor in GIS and German



## Tab D

## Technical Proposal

### Solution Overview

GeoComm mapping is purpose-built and designed as a 9-1-1 GIS mapping application. The cloud-native enterprise public safety mapping solution will provide a real-time picture of operational environments by aggregating data from local and other available sources on a web-based map display leveraging Esri technology.

GeoComm mapping can be used to display 9-1-1 caller location along with additional location-based data feeds such as RapidSOS, traffic, and weather at Emergency Communication Centers (ECCs). Using locally authoritative GIS data and visualizing public safety specific data feeds allows the mapping application to provide a true common operating picture (COP) which enhances overall incident awareness, response, and management. For customers like NCT9-1-1 who currently use GeoLynx Server for 9-1-1 mapping efforts, there will be a seamless transition and no downtime between cutover from GeoLynx Server to the new GeoComm mapping application.

The GeoComm mapping solution provides:

- 24x7x365 cloud hosted PSAP mapping application
- High availability, security, and scalability
- Reduced total cost of ownership
- 9-1-1 call location display
- Display of locally authoritative GIS data as well as externally hosted map layers
- Supplemental Caller Location display
- Dashboarding and analytics
- Enhanced user experience

GeoComm's proposal does not include any rights to inventions. GeoComm owns all Intellectual Property rights for all proposed solutions and services.



## GeoComm

Designed specifically for 9-1-1 call taking and emergency incident response and collaboration.

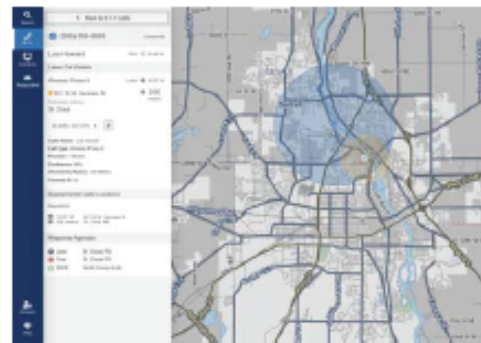
GeoComm is a purpose-built web-based mapping application built for use by public safety personnel 9-1-1 mapping needs. This cloud-hosted, enterprise solution provides a real-time picture of operational environments by aggregating data from local and other available sources on a web-based map display leveraging Esri technology.

GeoComm can be used to display 9-1-1 caller location along with additional location-based data feeds such as RapidSOS, traffic, and weather at Emergency Communication Centers (ECCs). Using locally authoritative GIS data and visualizing public safety specific data feeds allows the mapping application to provide a true common operating picture (COP) which enhances overall incident awareness, response, and management.

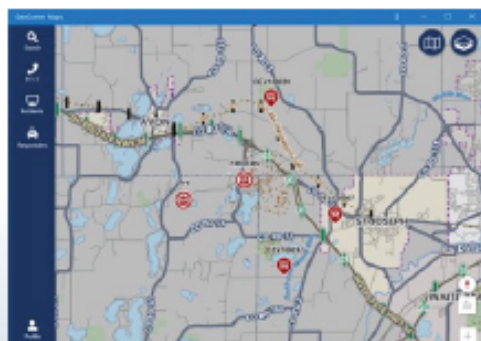
**This new software extends the robust features and capabilities in GeoComm's current mapping products. In addition, this software uses leading edge cloud-hosted technologies and provides some additional benefits including:**

- Ease of deployment
- Simplified maintenance and feature updates
- Enhanced security and reliability
- Reduced hardware/infrastructure costs and maintenance
- Up-to-date maps with simplified map data update process
- Increase in call taker and dispatcher satisfaction to improve user experience

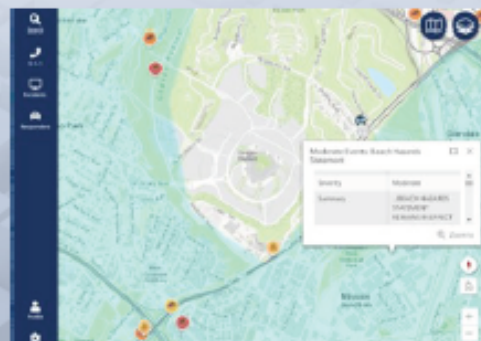
### User Experience



### 9-1-1, AVL, and CAD Data



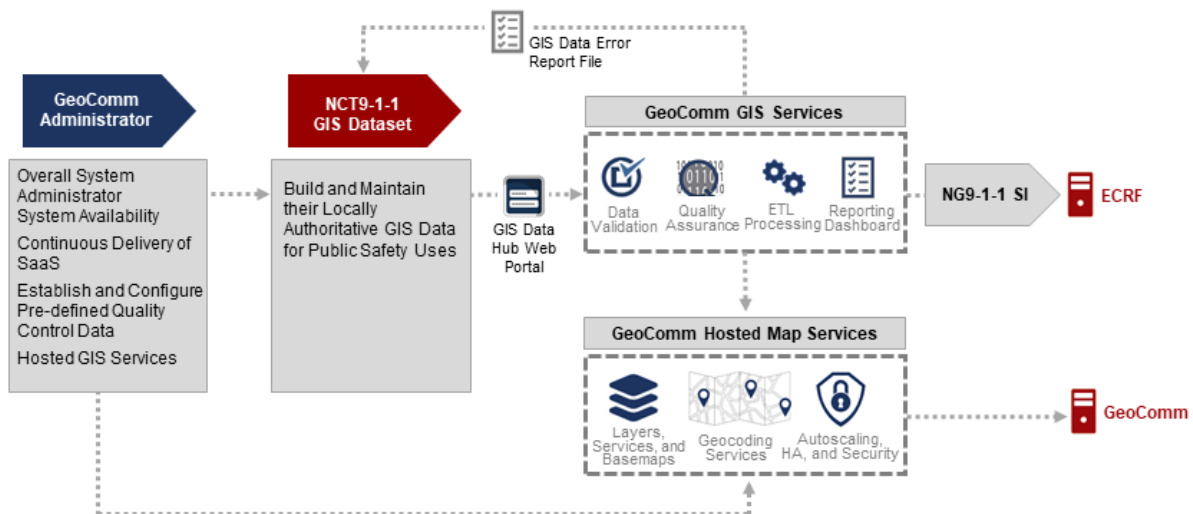
### Access External Data Sources



#GISimplified

## GIS Integration and Simplified End-to-End Solution

GeoComm is a full-service public safety GIS company and has maintained focus on delivering integrated GIS solutions to suit the needs of even the most demanding public safety agencies. From GIS data management tools, GIS services, and mapping applications to NG9-1-1 Core Solutions (NGCS) ECRF and LVF, GeoComm offers its customers a complete solution for all their public safety GIS needs. As agencies continue the migration to NG9-1-1 and adopting new technologies, GeoComm continues innovating our solution offerings to enable agencies to build, maintain and provision public safety grade GIS across their mapping applications and NGCS Functional Elements. As a GeoComm GIS data management and ECRF customer, with GeoComm's dispatch mapping, NCT9-1-1 will be able to leverage investment in the tools, training and GIS Enterprise environment with a simplified GIS update process via GeoComm GIS Data Hub. The same tools and process that will provision data to NCT9-1-1's ECRF will also be used to provision data to the GeoComm mapping.



## Physical and Cyber Security Measures

This section provides an explanation of security that will be implemented as part of GeoComm's proposed solution.

GeoComm is responsible for protecting GeoComm applications, hosted data, and the infrastructure that runs the services for the GeoComm mapping solution in the cloud. This infrastructure is composed of required hardware, software, data, and networking. GeoComm will work with NCT9-1-1 on components of the solution which are located within NCT 9-1-1's environment around physical access, overall system security design, and general system infrastructure security, where GeoComm is informed and/or consulted on such elements.

The proposed security measures are meant to be adopted as part of a larger security program to ensure complete system security for the comprehensive solution. GeoComm uses NENA

security standards and the NENA Next Generation 9-1-1 Security (NG-SEC) Audit Checklist as a baseline for system design. The proposed solution is based on current NENA NG9-1-1 security standards. NCT9-1-1 security standards which differ from NENA NG9-1-1 security standards will be handled via design negotiations and standard change control processes.

## **Application Security Features**

All communications between system components are over HTTPS. GeoComm's identity management solution is employed for all user facing applications which utilize a unique user least-privilege approach to user authorization. All APIs are similarly secured, requiring a pre-established secure user token or a trusted SSL client certificate. Data security controls include complex passwords and physical isolation of the data. Strict access controls are employed that authenticate and authorize individuals to the specific system or data as required by the NG-SEC Audit Checklist.

## **Network Security**

GeoComm employs network security best practices to ensure networks are properly protected. These best practices include firewalling, network separation, and intrusion prevention and alerting. GeoComm will ensure proper monitoring and remediation.

## **Application Access**

All access to the GeoComm mapping solution occurs through a suite of web interfaces and RESTful web services. The GeoComm mapping solution is accessed over HTTPS from a user's browser. Users are required to log into GeoComm's identity management system. GeoComm web services require HTTPS and an authorization token which is issued to the client at login and during configuration.

## **Application User Access**

User access is controlled by GeoComm's identity management solution. The solution supports industry-standard principals of least privilege and access management via role-based permissions while also requiring strong passwords and multi-factor authentication as required by the NG-SEC audit checklist. Application user passwords are designed to be hashed and salted to meet encryption best practices.

## **Application Security**

As part of GeoComm's software development methodology, period static code scans and operational vulnerability scans are executed to proactively monitor and mitigate security risks or vulnerabilities before applications are deployed in production environments.

Ongoing external security scans are performed and monitored, along with ongoing system hardening as required by the NG-SEC audit checklist.

## Employee Background Checks

A state and national-level criminal background check for all employment candidates is performed after GeoComm makes a candidate an offer of employment. These background checks are performed by True Hire, a nationwide background check provider.

In addition, upon hiring, the employee undergoes security clearance with the Federal Bureau of Investigation's (FBI) Criminal Justice Information Services (CJIS) division. This clearance is executed via fingerprinting by the Minnesota Department of Public Safety – Bureau of Criminal Apprehension (BCA) and CJIS security training. GeoComm employees are assigned a Level 4 Security Level within the CJIS database. In GeoComm's experience, this level is most commonly required by state-level agencies.

GeoComm's Human Resources department ensures all employees have an active status within CJIS. To ensure no gap in certification, all employees must go through re-certification at least 30 days prior to their certificate expiration.

## Product Roadmap

We have a long track record of enhancing our dispatch mapping solutions to embrace next generation mapping functions in 9-1-1. For example, GeoComm's GeoLynx Server dispatch mapping solution included a map-based tool for retrieval of LoST listServicesByLocation to show emergency service agencies at a given location on the map. GeoComm's GeoLynx Server supported retrieval of supplemental caller locations from the RapidSOS Clearinghouse LIS via the HELD protocol. We partnered with you (NCT9-1-1/NCTCOG), RapidSOS, and Google to do early 2D indoor pilot testing in December 2016 at Frisco, Texas and Android ELS Pilot Project in January 2018.

GeoComm has been a thought leader and innovator in the creation and use of 2D indoor GIS, as well as 3D indoor GIS to display accurate indoor and vertical locations. GeoComm provided the Common Operating Picture 3D platform used by over 100 public safety agencies for Super Bowl 52 LII. The system provided 3D detailed exterior and interior GIS using Esri ArcGIS technology as well as GeoComm 3D geocoding and location technology to accurately display incidents and responder locations.

The core component of the proposed solution is GeoComm's cloud-hosted web-based mapping solution. It is the next generation of GeoLynx Server, the web-based GeoLynx Server product in use by NCT9-1-1 today. Taking our nearly 25 years of experience with public safety GIS, and the lessons learned from over 100 customers utilizing GeoLynx Server today, GeoComm's mapping simplifies the deployment and support model and leverages the strengths of AWS. Purpose-built for public safety mapping, not adapted from a CAD system, starting with the early release program in April 2020, the general availability release in July 2020, GeoComm is focused on quarterly releases to continue to add features that assist telecommunicators in improving response times. It will start with leveraging agencies' local authoritative GIS data and core functionality for 9-1-1 call processing with additional features and functionality being

delivered on a quarterly basis. NCT9-1-1, as a key account with GeoComm today, will continue to provide input to features / functionality definition as well as feature prioritization. It is this type of customer relationship that has allowed and will continue to allow GeoComm to deliver the highest value features to key customers.

## Advanced Technical Support Capabilities

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GeoComm offers comprehensive technical support services. Our advanced technical support capabilities have been built up, refined, and successfully delivered over our nearly 25 years in business. Our technical support includes:

- Support Desk Services
- Remote Connection Services
- Software Updates and Enhancements

### 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 mapping system. 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 proposed 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.

## 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 BeyondTrust over the Internet. BeyondTrust enforces the use of Secure Sockets Layer (SSL) for every connection made to the site. All data is encrypted in transit using TLSv1.2. In addition, GeoComm supports common Virtual Private Network (VPN)s for remote connection.

## 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. GeoComm stays 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's mapping solution is a SaaS platform and lends itself to simple, regular updates. GeoComm has developed a rigorous software delivery methodology to meet the specific needs and demands of public safety agencies like NCT9-1-1. From development, to testing, to staging, to production, GeoComm utilizes industry leading tools to deliver updates and enhancements on a quarterly basis as well as hot fixes if necessary. The development to production process includes check points to ensure updates are successful and allows for instantaneous roll back if necessary. In addition to the platform updates, GeoComm's solution allows each agency subscribed to the solution to review and train on new features prior to enabling them for their agency, giving complete control to each agency as to if and when they will enable the new features.

In short, GeoComm's solution will deliver quarterly updates on a regularly scheduled basis and hot fixes on an as needed basis through a well-defined, rigorously managed process. This will ensure the solution is up to date and continually delivering valuable enhancements which each agency can control if and when they enable the features.

## Commitment to NG9-1-1

Since NG9-1-1 has been discussed, standardized, and developed, GeoComm has been committed to ensuring our solutions comply and align with evolving and upcoming standards. GeoComm will continue to be fully committed to NG9-1-1 into the future related to our geospatial solutions.

Over the last several years, GeoComm has become a proven provider of end-to-end GIS systems tailored to meet the needs of public safety agencies moving to NG9-1-1. GeoComm offers NG9-1-1 specific software and services, including NG9-1-1 GIS data assessment and development; GIS workflow consulting; software to maintain, manage, and provision NG9-1-1

GIS data; the Emergency Call Routing Function and Location Validation Function (ECRF/LVF) elements of the ESInet (Emergency Services IP Network); and tactical mapping for emergency responders and 9-1-1 Centers. GeoComm's solutions provide the tools necessary to geospatially route 9-1-1 calls, speed and enhance emergency response, improve data accuracy and quality, accelerate communications, and provide mission critical GIS-based decision support. GeoComm was first to demonstrate geospatial wireless call routing in 1999 at the APCO International Conference in Minneapolis, MN. This ground-breaking experience has helped shape our NG9-1-1 solutions portfolio and makes GeoComm the most experienced solutions provider in the industry today.

Our NG9-1-1 products and services have been delivered to states across the country, including Maine, New York, Vermont, North Carolina, Pennsylvania, North Dakota, South Dakota, Iowa, Kansas, Texas, California, and Washington.

## GIS and Location Innovation Leadership

In addition to achieving NCT9-1-1's goals identified in the RFP, GeoComm is well positioned to be your partner in GIS for 9-1-1 as the nation's 9-1-1 system continues to evolve. As an example: in 2015, the Federal Communications Commission (FCC) imposed new rules on wireless carriers which, for the first time, will require mobile phones to be located indoors, and eventually in three dimensions (including attributes such as elevation, and sub-address elements).

As a result, GeoComm has invested in innovation and research to understand new requirements and best practices for 9-1-1 GIS data needed to support indoor and Z-factor (elevation) 9-1-1 caller location. Through collaboration with commercial vendors Motorola Communications, RapidSOS, Micello, and HERE, and St. Cloud State University College of Science and Engineering, GeoComm has developed live operational 9-1-1 indoor mapping systems and, as a result, has identified critical 9-1-1 GIS data requirements for indoor mapping.



*GeoComm collaborating with St. Cloud State University College of Science and Engineering.*



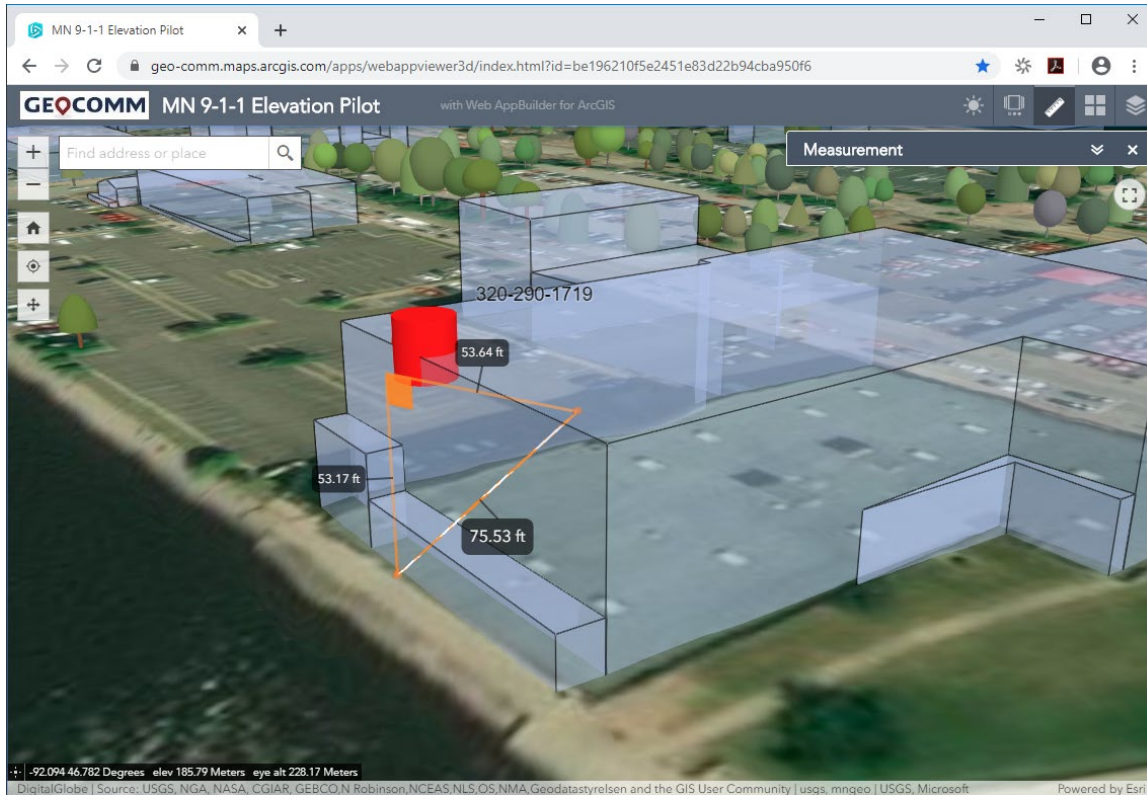
Three dimensional (3D) indoor mapping and real-time IoT feed mapping developed during this public private collaboration was first utilized operationally during the 2017 ESPN Summer XGAMES. The same technology was used to protect Super Bowl LII in February 2018, as well as other critical infrastructure across the City of Minneapolis.



*GeoComm Smart City Mapping in Minneapolis for safety and security during the 2019 ESPN Summer XGAMES*

In 2019 and 2020 GeoComm is actively focusing on scaling 3D mapping for 9-1-1. 3D mapping may become more and more important for 9-1-1, as additional FCC making in 2019 require wireless carriers to calculate and transmit raw geodetic position information (latitude, longitude, and height above ellipsoid) to 9-1-1 PSAPs. Raw position information itself is not actionable to 9-1-1 call takers, dispatchers, and responders, and only becomes actionable when combined with a map.

Following is a screenshot of GeoComm's 9-1-1 Elevation Testbed, currently being used in Minnesota to test 3D geodetic caller and responder location tracking technologies. The application is an ArcGIS Web AppBuilder application with a RapidSOS query widget custom developed by GeoComm. The application can display 3D ArcGIS Web Scenes hosted in ArcGIS Enterprise or on-line.



*GeoComm9-1-1 Vertical Mapping Test Bed*

The Minnesota implementation examined methods for creating 3D building shells across large geographic areas using automated feature extraction from aerial imagery to get building footprints and extruding the footprints into three dimensions using multi-pass LiDAR data.

If selected for this project, GeoComm will provide access to GeoComm Labs 9-1-1 Vertical Elevation testbed to NCT9-1-1 for testing 3D 9-1-1 caller positions when they become available, as well as for testing in live operational environments to determine how call takers, dispatchers, and responders in the NCT9-1-1 district may interact with 3D mapping data.

The testbed can directly connect to 3D web scenes created and hosted by NCT9-1-1, such as 3D maps built using Vricon data that NCT9-1-1 has licensed, 3D meshes and scenes created by the NCT9-1-1 small UAV drone program, and other 3D dataset created by NCT9-1-1 and hosted in NCT9-1-1 ArcGIS Enterprise or Online organizations.

The landscape for vertical location is changing rapidly. For example, in November 2019 the FCC adopted additional rules around the z-axis metric and height above ellipsoid. In 2020 the

National Emergency Address Database (NEAD) ceased operations. Additional FCC rulemaking around z-axis metrics in 2020 are anticipated. In addition, device-based hybrid location (location assisted by wi-fi and other sensors in mobile phones) is becoming more accessible to 9-1-1 centers, as is technology for improving device-based hybrid location inside buildings. By partnering with GeoComm NCT9-11-1 will benefit from leading edge technology in the 9-1-1 vertical mapping space.

## **Systems Engineering Processes, Configuration Management Controls, and Quality Assurance Processes**

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GeoComm strives to bring value to public safety clients by providing consistent processes. The following information regarding system engineering processes are incorporated into each of GeoComm's project plans. Quality Assurance, software quality, and objectives are specifically addressed in each plan. There are no changes needed to these programs to meet NCT9-1-1's project requirements.

### **Quality Management Approach**

Quality management assures the quality of project deliverables and the quality of the processes used to manage and create the deliverables. Project quality will be managed through documented internal processes to validate project deliverables are completed to the highest degree of quality possible. Quality Assurance (QA) is an integral part of all GeoComm projects.

### **Ensuring Software Quality**

GeoComm software development and testing processes are executed with measures to operate at and above industry standards. First and foremost, GeoComm uses the Scrum agile software development methodology. The Scrum methodology does many things to improve software quality, including:

- Shorter iterations of development and testing work which allows the team to be focused and frequently evaluate progress
- Working in teams to work through complex functionality in a collaborative manner
- Breaking large functionality down into smaller portions which ensures testing is performed earlier and more often
- An ability to more rapidly change the focus of development efforts to higher priorities

Also, GeoComm follows industry best practices of AWS and Esri. GeoComm is an AWS Technology Partner and an Esri Platinum Business Partner.

## Quality Objectives

The following objectives reflect the overall quality intentions to be applied throughout the project:

Project Element	Quality Objectives
Product Management	<ul style="list-style-type: none"> <li>• Market research is performed to identify problems users experience in their daily work</li> <li>• Functionality to be developed is expressed as user stories, which depict the functionality a user would want and expect</li> <li>• Acceptance criteria for each user story are composed to establish expectations for the programming and testing</li> </ul>
Design	<ul style="list-style-type: none"> <li>• Wireframe diagrams and application prototypes are developed to establish the workflow and understand potential usability issues</li> <li>• Prototypes are presented to existing and potential customers to evaluate</li> <li>• Application architecture is researched, designed, prototyped and evaluated</li> </ul>
Programming	<ul style="list-style-type: none"> <li>• Code is refactored to improve performance and maintainability</li> <li>• Unit testing is utilized to verify each part of the application developed performs as expected</li> <li>• Integration testing is performed to validate the application as a whole smoothly integrates</li> <li>• Peer code review is executed to ensure code, especially complex functionality, is implemented correctly and using best practices</li> </ul>
Testing	<ul style="list-style-type: none"> <li>• Test cases and scenarios are developed and maintained in a library for future use</li> <li>• New functionality or changes are tested for scalability, stress, negativity, usability, performance, and compliance with GeoComm standards</li> <li>• Acceptance criteria of each user story are verified</li> <li>• Regression testing of application is done to verify the overall quality of the software</li> </ul>
Technical Writing	<ul style="list-style-type: none"> <li>• Dedicated technical writer creates documentation</li> <li>• Technical writing goes through peer reviews and technical reviews to confirm readability and technical accuracy</li> </ul>

## Esri Partnership

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In March 2011, GeoComm became a Platinum Tier Partner with Esri. Platinum Tier Partners, the highest of three tiers in the partner network, are recognized for developing and delivering industry-leading GIS solutions and services on the ArcGIS software platform. As an Esri Platinum Partner, we are a leading innovator on Esri technology mapping the future of NG9-1-1. As one of 15 Esri Platinum Partners worldwide and the only public safety Platinum Partner, we have a unique understanding of how to maximize the value GIS can bring to public safety.

*“Esri values GeoComm’s long-term commitment and partnership to bring GIS technology to mission-critical 9-1-1 professionals. GeoComm’s knowledge of Esri technologies and the integration into their suite of GIS-centric solutions is commendable, as they support the needs of our mutual customers. These values are key characteristics as to why they are an Esri Platinum Business Partner.”*

-Mike King, Director, Emergency Communications & Fraud Solutions

The partnership provides GeoComm:

- Higher level of service and priority from Esri staff
- Advanced technical support from Esri compared to “general technical, marketing, and sales support” of other partnership levels (we can adopt the technology ahead of our competitors)
- Our staff can provide direction for their future product development (priority voice when it comes to how Esri technology is evolved for public safety)

As a Platinum Tier Partner, GeoComm maintains a high level of collaboration with Esri and allows us to be involved with the direction for their future product development.

Through the Esri Platinum Partner, GeoComm is involved with the Esri Partner Conference, Esri User Conference, Business Partner Conference, Developer's Conference, National Security Public Safety Summit, Technical and Business Meetings, Regional GIS meetings, and CTO Committee.

## AWS Technology Partnership

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GeoComm is part of the Amazon Web Services (AWS) Partner Network (APN) as a Select Tier Technology Partner. The APN is a global program for technology and consulting customers who leverage AWS to build, market, and sell their cloud-based offerings.

GeoComm’s collaboration with APN to utilize AWS services brings many benefits to our customers including state of the art security to protect the infrastructure that runs GeoComm’s

cloud-based public safety GIS solutions. In addition, the technology partnership heightens GeoComm capabilities to provide easy and secure customer GIS data uploading as well as an increased speed of GIS data updates within our customers' dispatch mapping applications.

To qualify for this program GeoComm, the first 9-1-1 technology company to become part of the APN, completed and satisfy several technical and business criteria for providing solutions and services in the APN. The following page contains an NCT9-1-1 project letter of support from AWS.



Amazon Web Services, Inc. ▪ 410 Terry Avenue N. ▪ Seattle, WA 98109

March 25, 2020

North Central Texas Council of Governments  
Centerpoint Three  
600 Six Flags Drive  
Arlington, TX 76011

To Whom it May Concern:

Amazon Web Services, Inc. (AWS) is very pleased to support Geo-Comm, Inc. in its efforts to assist the North Central Texas Council of Governments with the Request for Proposal (RFP) No. 2020-052 for Dispatch Mapping Services using the AWS Cloud. This letter confirms that Geo-Comm is an AWS Partner Network (APN) Select Technology Partner in good standing.

AWS offers commercially available, web-scale computing services that help organizations avoid much of the heavy-lifting typically associated with launching and growing successful applications. These services are based on Amazon's own back-end technology infrastructure and incorporate over a decade and a half of experience building one of the world's most reliable, scalable, and cost-efficient web infrastructures. The use of AWS will provide you with access to expertise in large-scale distributed computing and operations and will enable your applications to be robust and scalable.

AWS values and appreciates the opportunity to support Geo-Comm and we look forward to a long and productive partnership. If you have any questions, or require additional information, please contact Darryl Wilson, GovTech Account Manager at [darwild@amazon.com](mailto:darwild@amazon.com) or 469-684-4537.

Sincerely,  
Amazon Web Services, Inc.

A handwritten signature in black ink that reads "Jane Lacy". The signature is written in a cursive style and is positioned above a horizontal line.

Signature  
Jane Lacy  
AWS, Sr. Manager, Emerging Partners

## System Network and Hardware Specifications

### 9-1-1 Mapping Client Workstation Hardware Requirements

NCT9-1-1 is responsible for providing client workstation hardware meeting the following anticipated specifications. Finalized hardware specifications will be determined at a later date, closer to formal product release.

Note that as a web-based application, the application does not require dedicated workstations.

System Component	Hardware and Software Requirements
CPU	2.5 GHz dual core or higher
RAM	8 GB RAM or more
Display	17" or 21" monitor, 1280x1024 or higher, 24- or 32-bit color depth
Video card	512 MB discrete memory video card with OpenGL 2.0 support
Operating system	Windows 10 Enterprise (64 bit)
Network card	1 Gbps
Internet browser	Latest stable version of Google Chrome or Microsoft Edge
Minimum bandwidth	1 Mbps

Notes: 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.

One Mbps represents the minimum per position bandwidth required for standard mapping functions. Higher bandwidth is required for optimal performance and additional bandwidth considerations need to be made for items such as EagleView Pictometry Connect, additional imagery sources, external map sources and 3D map data display.

### Essential Server Systems

One (1) per data center:

System Component	Requirement
Operating system	Ubuntu Desktop 18.04 LTS
Display	1400 x 1050 resolution or higher
Input Device	Keyboard and mouse
CPU	2.5 GHz quad core or better
Available Hard Drive Space	250 GB or more
RAM	8 GB or more dedicated
NIC	2x 10/100/1000
Internet bandwidth	1.5 Mbps

Note: This design is assuming the i3 feed will be the same at each data center.



## Environmental Dependencies

NCT9-1-1 is responsible for providing the following environmental dependencies within the network:

- Required bandwidth (preferably redundant and monitored)
- DNS
- Monitoring (SNMP)
- Switches and cabling
- Firewalls
- Proxy
- Connection to Ubuntu repositories
- Connection to GeoComm repositories

## Designated Points of Contact

Phase	Contact Person
Bid Process	Ron Helterbrand, Territory Sales Manager rhelterbrand@geo-comm.com (320) 281-2193
Contracting Process	Heather Hoskins, Vice President of Finance and Administration hhoskins@geo-comm.com (320) 281-2385
Contract Administration (primary point of contact for receiving orders from Participating Entities)	Shirley Simon, Contract Management ssimon@geo-comm.com (320) 281-2168

## Scope of Work

The proposed project scope of work is provided on the following pages.

# Scope of Work

## Introduction

The following scope of work outlines an approach to onboarding NCT9-1-1 stakeholders to GeoComm’s mapping solution. The proposed approach will ensure successful migration from your existing GeoLynx Server Dispatch Mapping system, ultimately ensuring customer success from project commencement through ongoing operational support. The approach is based on the project management principles we apply to each project we undertake, spearheaded by GeoComm Project Manager, Jessica Frye, with support from our interdisciplinary team of GIS and public safety mapping industry experts. Our sole focus is making sure your project goals are not only met but exceeded. The Project Manager will be available to you throughout all project phases, including one-time and ongoing project phases.

## Customer Onboarding Project Phases

To accomplish successful system onboarding, we will work with NCT9-1-1 project stakeholders to execute a series of project phases to ensure the solution is utilized within the expected timeframe. These phases include:

Phase	Details
One: Project Initiation	<ul style="list-style-type: none"><li>Onsite Project Initiation Meeting</li></ul>
Two: Project Execution	<ul style="list-style-type: none"><li>GIS data setup and resource acquisition</li><li>Connection and Configuration of Local Resources</li><li>Application Training</li><li>Configuration and Testing</li></ul>
Three: Project Closeout	<ul style="list-style-type: none"><li>Acceptance Testing and Go Live</li><li>Transition to Ongoing Customer Support</li></ul>
Four: Ongoing Technical and GIS Support	<ul style="list-style-type: none"><li>Technical Support</li><li>Solution Monitoring</li><li>GIS Data Updates</li></ul>

While the tasks in each phase will happen mostly chronologically as listed, some will happen simultaneous with others.

Details about each project deliverable are provided below.

## Project Management Practices

Throughout the project, the GeoComm Project Manager will dedicate time to project management and ensure regular, 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. You will receive regular status updates which will include:

- General progress updates
- Meetings held, planned, or needed
- Issues/problems encountered or anticipated
- Schedule review
- NCT9-1-1 responsibilities

## Phase One: Project Initiation

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One of the first project activities is for the GeoComm Project Manager to reach out and communicate directly with the NCT9-1-1 primary project contact to ensure alignment and understanding of project objectives, project timelines and plan, project stakeholder involvement, and to schedule a collaborative team project initiation meeting. The GeoComm Project Manager will then communicate with the GeoComm project team to ensure a complete understanding of the scope of work, project schedule, and individual responsibilities to successfully complete your project on time and within budget.

### Project Initiation Meeting

The project initiation meeting will be held onsite with GeoComm and NCT9-1-1 project teams. It will include a presentation of the project approach and agreed upon anticipated project schedule. The GeoComm Project Manager and a Product Development representative will attend the meeting onsite, with other representatives from GeoComm's GIS and Product Development teams attending remotely. The meeting agenda will include:

- Introductions and identification of project team members and roles
- Timeline and deliverable review
- Onboarding approach review
- Project communication methods
- Resource requests

## Phase Two: Project Execution

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### GIS Data Setup and Resource Acquisition

The GeoComm mapping solution uses a variety of resources for reference in assisting emergency responders to efficiently and effectively respond to 9-1-1 calls. One important element is accurate GIS map data. Therefore, our system will utilize NCT9-1-1's locally sourced GIS data and aerial imagery.

Following the project initiation meeting, we will configure NCT9-1-1's existing GeoComm GIS Data Hub subscription to provide the mapping format required of the mapping system. The following tasks will be accomplished during this phase:

- NCT9-1-1's GIS data schema transformed into GeoComm mapping data schema
- NCT9-1-1 is responsible for providing GeoComm their aerial imagery if their imagery will be provided with GeoComm's mapping solution. Please note, additional charges will apply for storage based on the size of NCT9-1-1's aerial imagery.

### Connection and Configuration of Local Resources

GeoComm will work with NCT9-1-1 to configure the local Essential Servers and connection to Solacom i3 logging feeds. GeoComm will work with NCT9-1-1 to configure the local GIS services to optimize their use in the hosted mapping application. These can include:

- Local ArcGIS Server services
- Publicly available web mapping services
- EagleView Pictometry Connect
- GeoEvent Services

### Application Training

GeoComm will work in close collaboration with NCT9-1-1 to deliver in-person, train-the-trainer and administrative training courses. The comprehensive training program will ensure system administrators and end-users are empowered to utilize the mapping application to its fullest extent. Training materials will accompany the training courses to support attendees in successful learning.

Training will occur within 60 days and prior to implementation. The following table provides details about each training course. A detailed description of each course is provided below.

Training Course	Intended Audience	Maximum Number of Participants	Course Duration	Number of Sessions	Delivery Method
System Administrator	System Administrators	12	Up to 4 hours	1	Onsite
Train-the-Trainer	System Trainers	12	Up to 3 days	1	Onsite
GIS Data Management	Entire GIS team	12	Up to 8 hours	1	Onsite
Refresher and New Functionality	TBD, audience relevant to training topics	TBD based on training course	TBD based on training course	TBD based on training course	Onsite or Remote, TBD

- System Administrator training
- In person train-the-trainer format training
- GIS Data Management training
- As needed, refresher and new functionality training

A description of each follows.

### System Administrator Training

System administration training provides a basic understanding of functionality and ongoing maintenance of the application. In addition, system administrators are trained on adjusting the application to fit the needs of the individual PSAP. System administration training will be broken down into four basic components:

- System Architecture
- Maintenance Procedures
- Configuration Options
- System management, i.e., system reporting, solution monitoring

### Train-the-Trainer Training

The intent of the train-the-trainer program is to provide instruction to aid in the understanding of the functions of the application. Training will include instruction on training other application users and administrators and one observation session. This will be accomplished through a combination of the following:

- Training Instruction
- General Background Discussion
- Functionality Training
- Procedural Training

## GIS Data Management

GeoComm will provide instruction for updating the operational layers, dynamic services, basemap services, geoprocessing services, geocoding services, GIS layers and all other web services that rely on NCT9-1-1's enterprise production GIS maintenance workflows.

GeoComm will develop a workflow in MS Visio for the required provisioning of GIS data and NCT9-1-1 will have the opportunity to review and provide feedback before workflows are finalized.

## Refresher and New Functionality Training

GeoComm will develop and modify a training plan as necessary to accommodate to progressive release of new functionality up to and through final system acceptance. This may include refresher training sessions and full training sessions based on current functionality. This training will be delivered remotely.

## Help Guide

Following training, at a simple click of a button, 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. NCT9-1-1 could print the help guide for users, if needed.

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.

In addition, should the need for supplemental training materials be required to support the needs of the region, GeoComm will work with stakeholders to develop and deliver the training materials as agreed upon between both parties.

## Application Configuration and Testing

After NCT9-1-1's GIS data has been configured for use in the system and a system design has been approved, GeoComm will:

- Set up users and passwords
- Set up system roles and groups
- Configure ALI
- Configure GIS Services
  - Configure NCT9-1-1 GIS data for availability via Esri powered web services which the 9-1-1 mapping application will connect to

We will complete a series of remote system configuration tasks to deliver the 9-1-1 mapping production system. Each application will undergo a series of configuration measures, including:

- Testing and verifying GIS data
- Configuring licensing and all technical components
- Configuring user and admin settings and features
- Testing address locations
- Testing and/or configuring simulated 9-1-1 calls

## Phase Three: Project Closeout

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### Acceptance Testing and Go Live

GeoComm will work with NCT9-1-1 to finalize an acceptance test plan and PSAP cutover plan for the application. Upon completion of training, configuration, and testing, GeoComm will work with you to remotely administer the final system Acceptance Test Plan (ATP) to ensure all functionality contracted for is included in the final system. After system implementation is complete and accepted, GeoComm will provide remote support for the PSAP cutovers according to a schedule provided by NCT9-1-1.

### Transition to Ongoing Customer Support

The GeoComm Project Manager is dedicated to ensuring the ongoing satisfaction of NCT9-1-1. After the system has been fully accepted, they will work with the NCT9-1-1 team, the GeoComm project team, and the GeoComm technical and GIS support teams to transition all project details and ensure NCT9-1-1 has all resources required for ongoing support and success of the system.

## Phase Four: Ongoing Technical and GIS Support

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### Technical Support

GeoComm provides technical support by telephone or email during regular business hours, 8 a.m. to 5 p.m. Central Standard Time, Monday through Friday, excluding holidays. Emergency Technical Support services are available 24/7 via telephone. Emergencies are classified by issues which have a critical or major impact on the functionality of the overall system. GeoComm employs system monitoring and alerting to immediately notify on-call technical support technicians of potential system issues during and outside regular business hours. NCT9-1-1 will have access to web dashboards to view component status and monitor in-network devices such as Digi devices and Essential Servers.

## **Solution Monitoring**

GeoComm utilizes monitoring and logging solutions which capture logs and notify support of issues detected within the solution. Notification is provided to support via SMS and email. Solution logging capabilities are centralized for GeoComm support personnel which include alarm level categorization and filtering to provide thresholds to assist in troubleshooting and the escalation of notifications to GeoComm support. A customer facing system availability dashboard is available to observe solution and service availability status.

## **GIS Data Updates**

To meet the GIS data requirements in this RFP, GeoComm proposes the NCT9-1-1 GIS data and web map services be hosted by GeoComm. Ongoing GIS map data updates will be provisioned to the GeoComm mapping solution upon submittal of that data to GeoComm GIS Data Hub. This proposal considers that NCT9-1-1 already has a subscription to GeoComm GIS Data Hub.

As an alternative option, and as part of negotiations, NCT9-1-1 could host the data and web map services, though this alternative approach significantly impacts the technical requirements as they relate to GeoComm's offering.

## **Conclusion**

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From project initiation through project closeout and ongoing support, our large staff of GIS public safety experts will ensure NCT9-1-1 project stakeholders are trained, have the knowledge, and are supported so the GeoComm mapping system can be used to its full potential.

## **Compliance Matrix**

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The completed Compliance Matrix is provided on the following pages.





**REQUEST FOR PROPOSALS**  
**For**  
**NCT9-1-1 Dispatch Mapping**  
**RFP # 2020-052**

**5.3 PRODUCTION ENVIRONMENT**

The web-browser-based solution will operate on an existing personal computer (PC) at each station in the PSAP. This RFP is for 40-45 PSAPs, for up to a total of 175 PCs. PCs in the PSAPs will not have a direct connection to the internet. NCT9-1-1 will provide a relay of internet-based data through the private network via the central data center. Proposed solutions must run in a Windows 10 environment on the Microsoft Edge browser.

Understood

Details to support the answer:

GeoComm will provide a web-browser-based dispatch mapping solution that is hosted from GeoComm's cloud platform and will operate on each existing PC at 40-45 PSAP locations on up to 175 PCs.

GeoComm understands that internet data is relayed through NCT9-1-1's private network via their central data center and internet is not directly available at each PSAP.

The proposed solution will run on Windows 10 with the Microsoft Edge browser.

**5.4 NCT9-1-1 REQUIREMENTS**

**5.4.1 Understanding of Proposed Solution**

The respondent must confirm an understanding of the proposed NG9-1-1 web-based enterprise mapping solution, as well as the principles of the NG9-1-1 standards listed above, and describe how the solution displays automatic location identification (ALI), PIDF-LO,<sup>1</sup> and geodetic-coordinate location data on a map.

Understood

Details to support the answer:

GeoComm confirms understanding of NG9-1-1 web-based enterprise dispatch mapping solutions. GeoComm has delivered more NG9-1-1 web-based enterprise mapping solutions to more 9-1-1

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<sup>1</sup> Presence information data format location object.



customers across the United States than any other vendor, including in NCT9-1-1's own environment for many years. GeoComm also confirms understanding of the principles of the NG9-1-1 standards listed above. GeoComm actively participates in NENA workgroups and events, including in leadership roles, related to NG9-1-1 i3 architecture, NG9-1-1 GIS, NG9-1-1 PSAP, ECRF, LVF, NG9-1-1 Additional Data and IoT. GeoComm regularly actively attends annual NENA events including the Standards and Best Practices (SBP) conference and Joint-Committee Meetings (JCM), and 9-1-1 Goes to Washington. GeoComm has been committed to NG9-1-1 standards and has long supported the development efforts and NENA Industry Collaboration Events (ICE) participation, as well as deploying NG9-1-1 solutions since 2011.

GeoComm's dispatch mapping solution receives 9-1-1 call data from Call Handling Equipment via electronic and programmatic interfaces. Civic address and geodetic-coordinate location data is parsed from the received location feeds, geocoded if necessary, and displayed on the 9-1-1 mapping application. No communications service providers are yet delivering PIDF-LOs to PSAPs, but GeoComm will support PIDF-LO locations when they do.

#### 5.4.2 Live Demonstration of Proposed Solution

Respondents may also be required to provide a live demonstration of its solution to the evaluation committee.

Understood

Details to support the answer:

GeoComm understands the value of providing a live demonstration of a dispatch mapping solution to the evaluation committee and is committed to supporting this request.

#### 5.4.3 Implementation Requirements

The implementation timeline must not exceed 30 calendar days.

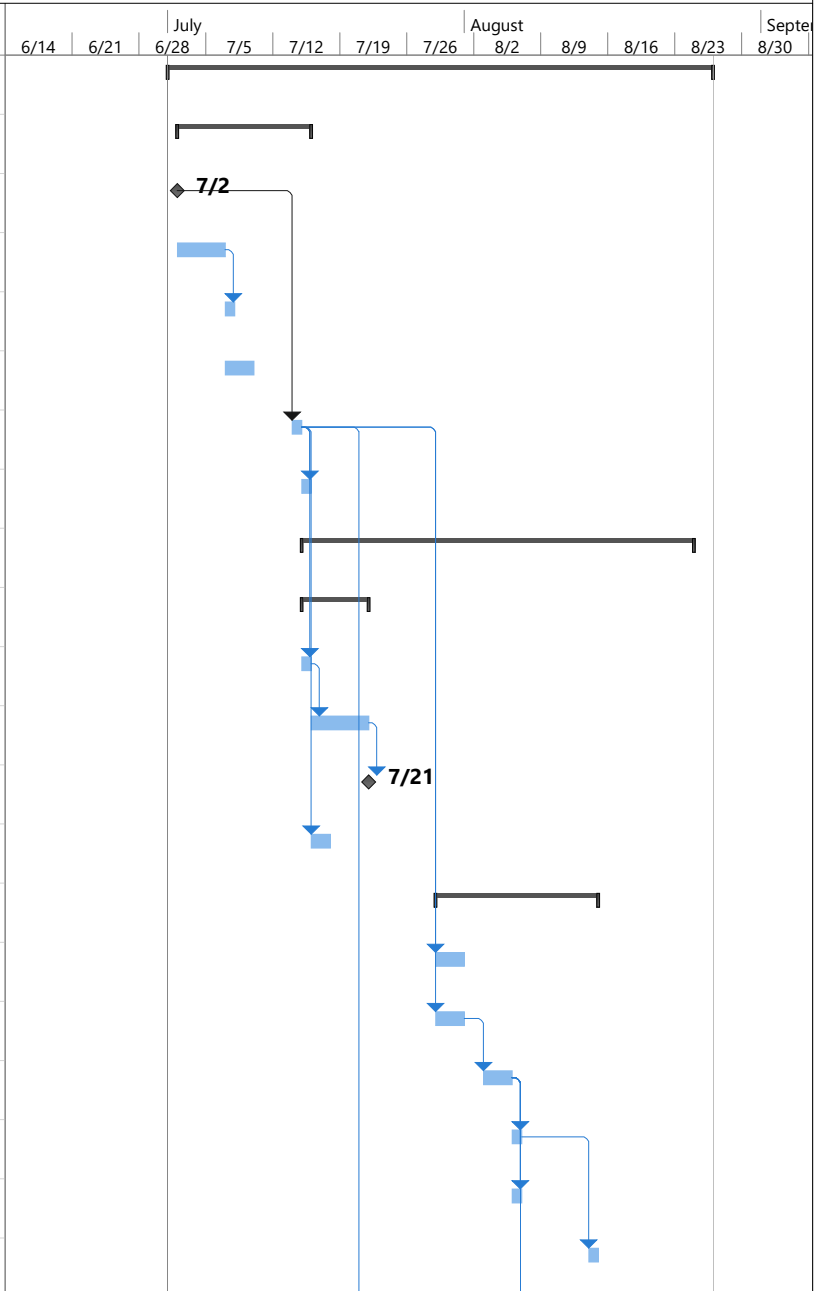
Understood

Details to support the answer:

GeoComm has developed a project timeline to implement the proposed system within 30 calendar days. A Work Breakdown Structure is provided on the following pages.

### NCT9-1-1 Dispatch Mapping Services

ID	Task Name	Duration	Start	Finish	July							August				Sept		
					6/14	6/21	6/28	7/5	7/12	7/19	7/26	8/2	8/9	8/16	8/23	8/30		
1	<b>Contract Signed</b>	<b>40 days</b>	<b>Wed 7/1/20</b>	<b>Wed 8/26/20</b>														
2	<b>Phase One: Project Initiation</b>	<b>9 days</b>	<b>Thu 7/2/20</b>	<b>Wed 7/15/20</b>														
3	Call to NCT9-1-1 project manager to schedule on-site project initiation meeting (PIM)	0 days	Thu 7/2/20	Thu 7/2/20														
4	Project plan drafted	2 days	Thu 7/2/20	Mon 7/6/20														
5	Internal project meeting	1 day	Tue 7/7/20	Tue 7/7/20														
6	Prepare for PIM	3 days	Tue 7/7/20	Thu 7/9/20														
7	Conduct on-site project initiation meeting	1 day	Tue 7/14/20	Tue 7/14/20														
8	Finalize project plan and confirm timeline	1 day	Wed 7/15/20	Wed 7/15/20														
9	<b>Phase Two: Project Execution</b>	<b>29 days</b>	<b>Wed 7/15/20</b>	<b>Mon 8/24/20</b>														
10	<b>GIS data setup and resource acquisition</b>	<b>5 days</b>	<b>Wed 7/15/20</b>	<b>Tue 7/21/20</b>														
11	Configure NCT9-1-1's map data into GeoComm mapping data schema	1 day	Wed 7/15/20	Wed 7/15/20														
12	Complete map data set up for application	4 days	Thu 7/16/20	Tue 7/21/20														
13	Conduct meeting with NCT9-1-1 to review map data setup	0 days	Tue 7/21/20	Tue 7/21/20														
14	Draft GIS data maintenance workflows for training	2 days	Thu 7/16/20	Fri 7/17/20														
15	<b>Connection and configuration of local resources</b>	<b>13 days</b>	<b>Wed 7/29/20</b>	<b>Fri 8/14/20</b>														
16	Assist NCT9-1-1 to configure the local essential servers	3 days	Wed 7/29/20	Fri 7/31/20														
17	Complete the connections to Solacom i3 logging feeds	3 days	Wed 7/29/20	Fri 7/31/20														
18	Configure NCT9-1-1's local GIS services to be used in mapping application	3 days	Mon 8/3/20	Wed 8/5/20														
19	Provide NCT9-1-1 an acceptance test plan (ATP) to review and provide input	1 day	Thu 8/6/20	Thu 8/6/20														
20	Provide NCT9-1-1 a draft technical support SOP	1 day	Thu 8/6/20	Thu 8/6/20														
21	Finalize ATP	1 day	Fri 8/14/20	Fri 8/14/20														





### NCT9-1-1 Dispatch Mapping Services

ID	Task Name	Duration	Start	Finish	July							August			Sept				
					6/14	6/21	6/28	7/5	7/12	7/19	7/26	8/2	8/9	8/16	8/23	8/30			
42	<b>Phase Three: Project Closeout</b>	<b>2 days</b>	<b>Tue 8/25/20</b>	<b>Wed 8/26/20</b>															
43	<b>Acceptance Testing and Go Live</b>	<b>1 day</b>	<b>Tue 8/25/20</b>	<b>Tue 8/25/20</b>															
44	Conduct remote ATP testing	1 day	Tue 8/25/20	Tue 8/25/20															
45	Conduct meeting to review the SOP to transition to ongoing customer support	1 day	Wed 8/26/20	Wed 8/26/20															
46	Implementation complete	0 days	Tue 8/25/20	Tue 8/25/20															
47	<b>Phase Four: Ongoing Technical and GIS Support</b>																		
48	PSAP Cutovers																		
49	Technical Support																		
50	Solutions Monitoring																		
51	GIS Data Updates																		
52	9-1-1 Vertical Testbed Access																		



#### 5.4.4 Training Requirements

An in-person, train-the-trainer format is required. Training materials must be provided by the vendor and electronic materials are acceptable. Training must be completed within 60 calendar days of and prior to implementation.

Understood

Details to support the answer:

#### Application Training

GeoComm will work in close collaboration with NCT9-1-1 to deliver in-person, train-the-trainer and administrative training courses. The comprehensive training program will ensure system administrators and end-users are empowered to utilize the mapping application to its fullest extent. Training materials will accompany the training courses to support attendees in successful learning.

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application to fit the needs of the individual PSAP. System administration training will be broken down into four basic components:

- System Architecture
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GeoComm will develop a workflow in MS Visio for the required provisioning of GIS data and NCT9-1-1 will have the opportunity to review and provide feedback before workflows are finalized.

### **Refresher and New Functionality Training**

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### **Help Guide**

Following training, at a simple click of a button, 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. NCT9-1-1 could print the help guide for users, if needed.



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.

In addition, should the need for supplemental training materials be required to support the needs of the region, GeoComm will work with stakeholders to develop and deliver the training materials as agreed upon between both parties.

## **5.5 DETAILED SYSTEM REQUIREMENTS**

### **5.5.1 Mapping Solution Requirements**

1. Locate an address or street within NCT9-1-1's GIS dataset and neighboring jurisdictions
  - Complies
  - Complies Partially
  - Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution allows a user to locate an address or street using NCT9-1-1's GIS dataset and simultaneously searches Esri's ArcGIS Online World geocode service to return results from each source both within NCT9-1-1's GIS dataset and in neighboring jurisdictions.

2. Display geodetic coordinates:
  - i. As the cursor is moved around the map
  - ii. When a location is selected by a left-button mouse click
    - Complies
    - Complies Partially
    - Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution will display location coordinates for cursor location as well as allows a user to left-button mouse click on a location on the map to display the geodetic coordinates. The user will click and lock onto a location which provides a static set of geodetic coordinates which will not change until the user clears the pop-up or does another left-button mouse click at a different location on the map. The geodetic coordinates can display in latitude and longitude in decimal degrees, degrees minutes seconds, as well as degrees decimal minutes; the user can toggle between the different formats of latitude and longitude.



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3. Provide ability to measure distance in:
- i. Two dimensions allowing for multiple vertices in the distance
  - ii. Three dimensions allowing for multiple vertices in the distance
- Complies
  - Complies Partially
  - Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution allows a user to measure distance with multiple vertices in two dimensions and the ability to see those distance measurements in imperial and metric units of measure. GeoComm's dispatch mapping solution also enables users to measure areas, which can be useful during emergencies impacting larger areas such as floods, fires, spills, etc.

GeoComm's dispatch mapping solution is planned in its roadmap to support three-dimensional measurement. GeoComm welcomes NCT9-1-1's feedback on the design and priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program. GeoComm is committed to optimizing the user experience for telecommunicators and recognizes that features need to be intuitive and easy to use in mission critical situations and workflows. Therefore, GeoComm believes that new capabilities, such as working in three dimensions in 9-1-1 dispatch workflows must be carefully vetted before they are included as standard functionality to all users. Via this proposal, GeoComm invites NCT9-1-1 to participate in such usability testing before the functionality is released, including by participating in GeoComm's 9-1-1 vertical test bed program.

4. Access map features' visible attributes (i.e., identify tool) as configured in the feature set layer file
- Complies
  - Complies Partially
  - Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution supports display of features' visible attributes within supplemental feature services that overlay the basemaps and additionally plans in its roadmap to provide the ability for a user to access the attributes of visible features, including layers in the basemap, as configured. GeoComm welcomes NCT9-1-1's input on the design and priority of this functionality relative to other roadmap items as part of GeoComm's Key Account Program.

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5. Basic map navigation—pan, zoom, and tilt, with undo up to 10 steps

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution allows a user to pan the map with left-button mouse click and drag; zoom with navigation buttons, mouse scroll wheel, or shift left-button mouse click and drag and undo up to 10 map navigation steps with back and forward buttons.

GeoComm's dispatch mapping solution roadmap includes plans to support three-dimensional navigation and tilt available at the time of NCT9-1-1's proposed implementation timeline. GeoComm welcomes NCT9-1-1's feedback on the priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program. GeoComm is also committed to optimizing the user experience for telecommunicators and recognizes that features need to be intuitive and easy to use in mission critical situations. Therefore, GeoComm believes that new capabilities, such as working in three dimensions in 9-1-1 dispatch workflows must be carefully vetted before they are included as standard functionality to all users. Via this proposal, GeoComm invites NCT9-1-1 to participate in such usability testing before the functionality is released, including by participating in GeoComm's 9-1-1 vertical test bed program.

6. Plot spatially enabled wireless, wireline, VoIP, and IoT events

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution will plot calls/events that come through a 9-1-1 feed, which is understood to be Solacom i3 logging services at the time of implementation. GeoComm's 9-1-1 call processing includes ALI parsing logic rulesets which are configured to detect the type of 9-1-1 call. 9-1-1 calls/events display the call type with a unique icon and attribute information.

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7. Allow for customizing symbology/icons for different service classes

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution displays unique symbology/icons based upon different service classes and ALI parsing rules. Specifically related to 9-1-1 call processing, GeoComm has a desire to provide optimal user experience with training and documentation resources within the dispatch mapping solution that matches what the user sees and also has proper contrast between the icons and the map to help with vision impairment. Therefore, GeoComm does not envision having icon customization available for 9-1-1 call locations displayed on the map.

8. Zoom to current event at a user-level customizable scale of a telecommunicator's active emergency call, with a configurable geographic extent timeout option after the call is released i.e., the map will zoom out to the full predetermined zoom extent of the relevant PSAP

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution will zoom to current events with a fixed scale at the time of NCT9-1-1's proposed implementation timeline, however functionality to achieve optimized zooming to emergency call locations is planned in GeoComm's dispatch mapping solution roadmap. Currently, GeoComm is not planning a configurable geographic extent timeout after the call is released as there are concerns with usability and risks associated with caller locations automatically clearing when the telecommunicator are still within call taking and/or dispatch workflows. GeoComm welcomes NCT9-1-1's feedback on the design and priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program.

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9. Create an event manually through means of a markup functionality

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm plans in its dispatch mapping solution roadmap to support telecommunicator-created event markup functionality. As such, this functionality will not be available at the time of NCT9-1-1's proposed implementation timeline. GeoComm welcomes NCT9-1-1's feedback on the design and priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program.

10. Generate vehicular routing instructions to an event

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm dispatch mapping solution roadmap plans to support vehicular routing functionality. As such, functionality will not be available at the time of NCT9-1-1's proposed implementation timeline. GeoComm welcomes NCT9-1-1's feedback on the design and priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program.

11. Use current geographic data formats, notably Esri SDE geodatabases, image services, web services and shapefiles, as well as all Open Geospatial Consortium (OGC) formats

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution and platform are powered by Esri ArcGIS technology which allows support of many data formats, including file and SDE geodatabases, image services, shapefiles and the ability to consume many types of web services. OGC has many standards, however GeoComm generally follows most commonly used standards that are also supported by Esri's web

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technologies, including WMS, WMTS, KML and WFS, but does not plan to support “all” OGC formats and schemas such as including but not limited to OGC AIXM (for aeronautical information mapping), CAAML (for Canadian avalanche mapping), and OS MasterMap GML (for British Ordnance Survey mapping), to name a few. GeoComm will continue to evaluate new and relevant OGC formats to support as they emerge.

12. Use current imagery available in several formats, web-mapping services

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm’s dispatch mapping solution will support the ability to consume imagery in an ArcGIS Map Service, an ArcGIS Image Service, WMS and WMTS formats at the time of implementation.

13. The call-taker workstation PC shall be able to run the mapping application without impairing the operation of the automatic number identification (ANI/ALI) workstation or the network. Further, the application shall scale and render accordingly to fit the implementation environment

- i. Testing by the call-handling equipment (CHE) vendor necessary to verify non-interference with the CHE may incur fees. These fees will be paid by the selected respondent.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm’s dispatch mapping solution is designed to work on a workstation PC that is also running other applications including a call handling application without impairing the workstation PC or the network. GeoComm will be responsible for testing fees (at similar rates we have experienced with CHE vendors not to exceed \$10,000) related to the dispatch mapping solution cohabitating with the CHE vendor.

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14. The mapping application shall automatically populate the map using ALI, PIDF-LO and/or geodetic coordinates via protocols sharing the CHE data.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution will automatically populate the map with 9-1-1 caller locations coming from the 9-1-1 feed whether the call locations are expressed as civic address locations or geodetic coordinates.

15. The mapping application shall differentiate between Phase I and Phase II wireless, VoIP, Geodetic, and wireline calls.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution differentiates between the various 9-1-1 call types, including Phase I and Phase II wireless, VoIP, SMS text-to-9-1-1, telematics and wireline. The different call types are expressed as unique icons that appear on the map at call locations, as well as in the 9-1-1 call list and with 9-1-1 call details description.

16. The mapping application shall support up to 300 layers to be defined by NCT9-1-1 and made available in the private network from the central data center.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution and platform are powered by Esri ArcGIS technology which allows support to publish and display many layers. The dispatch mapping solution will support up to 300 layers being published and available for use in the mapping display. However, their geometry type, data size, service type, and defined style will factor into determining how many can be displayed within any one instance of the mapping application running on a workstation. GeoComm has years of experience in working with clients to optimize display of maps containing many layers and will work with NCT9-1-1 to optimize the display of the desired layers.

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17. All layers managed by NCT9-1-1 shall be searchable, including intersections. Search results will be returned based on the current map extent of the end user i.e. location-based searching.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution utilizes Esri address locators to provide geocoding and search of civic addresses, roads, intersections, places / points of interest, and the ArcGIS Online World geocode service. GeoComm plans in its roadmap to make all layers in NCT9-1-1 GIS data searchable and to return search results based upon the user's current map extent.

18. The mapping application and the map data shall be easily updated from the mapping server, or utilizing a cloud-based tool, without interfering with the telecommunicators' workflows or necessitating onsite updates at each PSAP.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution is easily updated without interfering with telecommunicators' workflows or requiring updates at each PSAP. Once GIS data updates are submitted there is nothing else required for NCT9-1-1 or each PSAP to see the GIS changes reflected in the telecommunicators' maps.

19. Mapping data updates (excluding cached basemaps where applicable), shall be dynamic in nature, allowing for real-time updates without affecting the telecommunicator's workflows; provisioning GIS data from the Spatial Interface (SI) is desired.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution will apply map data updates for the GIS web services (map, feature and geocoding services) prior to cached basemaps being updated. This is to enable the map

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updates to be available as quickly as possible. GeoComm's Spatial Interface supports both the NENA ATOM feed as referenced in the i3 v2 document, and a bulk load option is also available. The bulk load option is the method that will be utilized by GeoComm's dispatch mapping solution to receive mapping data updates. It is GeoComm's intent to support SI provisioning, however, the dispatch mapping solution's GIS web services utilize Esri ArcGIS technology and an architecture where mapping data updates are provided via the SI is not currently available to provide a superior update process for the ArcGIS web services.

20. Mapping updates may not impact call-handling operations (i.e., lower priority, background, benign processing).

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution utilizes web technology wherein map updates occur on the server side of the system, not the client side of the system. As a result, the map update process has no impact on any systems running on the call taker position such as call-handling operations. Map updates are generally realized by end users simply by panning or zooming the map or refreshing the page in the web browser.

21. Ability to render vector and raster datasets in both 2D and 3D

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution renders vector and raster datasets in 2D. Further, the product roadmap plans to include the ability to render vector and raster datasets in 3D. GeoComm has developed multiple proof of concept 3D GIS applications for public safety, including the Common Operating Picture map used by over 100 public safety agencies during Super Bowl LII.

While, GeoComm recognizes the value of and use cases for 3D mapping in public safety, GeoComm also recognizes there are challenges to be worked through before introducing 3D mapping for mission critical use by telecommunicators for typical geographies that city and county PSAPs work in. Via this proposal, GeoComm invites NCT9-1-1 to participate in such usability testing before the functionality is released, including by participating in GeoComm's 9-1-1 vertical test bed program.





22. Ability to integrate Esri and non-Esri formatted data from IoT devices provided through the data center on the private network

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution provides the ability to integrate with data from IoT devices mapped using common Esri formats and technologies such as dynamically updated features services and ArcGIS GeoEvent Server, as well non-Esri formatted data. GeoComm has experience with connecting to thousands of IoT sensors in the Super Bowl LII project in Minneapolis. Sensors and systems for the Super Bowl project included fixed and mobile cameras, thousands of BLE beacons, access control systems, GPS and location services systems, and incident management systems. GeoComm has experience authoring custom GeoEvent server connectors to external systems using Java. GeoComm also has significant experience integrating big data pipelines commonly required in IoT integrations with enterprise GIS systems using technologies such as Kafka and direct web socket interfaces into web mapping applications.

23. Ability (future or current) to extend the location of a caller including a "breadcrumb" trail, and mapping components of the mapping interface to mobile devices

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution is built as a Progressive Web Application (PWA), as well as with responsive design to support multiple form factors, including workstation PC's, tablets, and mobile devices. GeoComm's roadmap plans to enable certain functionality that is valuable for use cases with tablets and mobile phones, including the "breadcrumb" trail of caller locations.

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24. Pass along all i3 log events, as defined for GIS activity, to i3 logging services

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm is and has always been committed to adhering to NENA's standards across its entire product suite. The current NENA i3 v2 standard does not include a description and standardization of which elements generate which log event types, including for GIS, and this information is designated to be worked on in a future revision to the standard. GeoComm actively participates in the i3 working group and will continue to monitor for the committed to descriptions and add the requirements to the roadmap when defined.

25. Ability to do LoST queries and return a URI

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap includes plans for supporting telecommunicator use cases for LoST queries returning URIs. However, it should be noted that a URI may have little meaning to a human user, and so GeoComm is also designing LoST interaction user experiences that present meaningful information to human users such as presenting **<displayName>** rather than **<uri>** values in LoST query responses to end users. It should be further noted that LoST provides a complete grammar for interrogating an ECRF/LVF GIS database in meaningful ways beyond simple service mapping requests, and as a result GeoComm is designing human user interactions for additional LoST query types including Location Validation and List Services By Location requests. GeoComm offers additional capabilities related to LoST queries with its NG Core Services product line.

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26. Ability to do HELD requests for updates from LIS

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution proposed herein will use RapidSOS' proprietary API for supplemental caller locations to ensure support can be provided for new enhanced data elements without the delay of waiting for HELD and LIS standards (i.e. IETF and NENA) updates, such as for new data elements provided via the mobile phone OS for which RapidSOS provides immediate support.

GeoComm will commit to roadmap HELD requests to get location updates directly from Location Information Server (LIS) systems, based on further discussions with NCT9-1-1 of HELD vs. RapidSOS proprietary API.

27. Ability to display a "breadcrumb" trail from Wireless Devices

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap plans to support a "breadcrumb" trail of caller location updates coming from wireless devices. GeoComm expects to use a similar user experience design as with GeoComm Dispatch Map which is a Windows desktop application. In that solution, up to the last three updates were connected to the current caller location via a "call path" with an icon indicating this, which can be clicked to get essential information about that call location including time, location and uncertainty radius distance. GeoComm welcomes NCT9-1-1's input on the design and priority of this functionality relative to other roadmap items as part of GeoComm's Key Account Program.



28. Ability to display EIDO information

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap plans to support display of EIDO information, however GeoComm looks to NENA and other relevant standards bodies to fully define the i3 standards needed for interfaces, conveyance and interoperability of EIDO. In addition, GeoComm recognizes there must be general industry acceptance of the approach, which includes interoperability testing at events such as NENA Industry Collaboration Events to determine efficacy of EIDO as the preferred method to pass emergency incident data.

**5.5.2 Map Display Requirements**

The respondent must indicate its strategy for keeping abreast of the evolution of Esri's enterprise server technology, the CHE-to-mapping-application interface, and any other open source or commercially accessible GIS-focused technology.

- Understood

Details to support the answer:

GeoComm is a Platinum Esri Business Partner which allows for many interactions that keep GeoComm abreast of the evolution of Esri technology and web mapping, including an assigned Technical Advisor and Premium Support Manager who GeoComm meets with regularly to both be informed and collaborate on current projects. GeoComm regularly sends development and product management staff to Esri conferences, including the Esri Developer Summit.

Regarding keeping abreast of CHE-to-mapping-application interface technologies, GeoComm is a national provider of CAD and CHE vendor agnostic tactical mapping applications. Unlike many other tactical mapping solutions that are sub-components of proprietary CHE or CAD vendor solutions, GeoComm tactical mapping applications must, by definition, interface with all CHE and CAD vendor solutions. This approach will help NCT9-1-1 avoid "vendor lock in", where upgrading to a different CHE vendor in the future would take down the mapping systems. Since GeoComm's business is wholly focused on GIS mapping for 9-1-1, we have the time and resources to focus on CHE to mapping interfaces, and this is not a secondary mission for GeoComm like it is for some other vendors whose primary business is CHE and/or CAD.



At the same time, the nature of 9-1-1 caller information and location is rapidly changing. Many CHE vendors are building non-standardized proprietary interfaces to supply new information to mapping, even before some NG9-1-1 standards are completely delivered. GeoComm is committed to working with CHE vendors to support these interfaces during transitions to NG9-1-1. In addition, to keep abreast of evolving technology requirements in this area, GeoComm actively participates in NENA workgroups and events related to NG9-1-1 i3 architecture, NG9-1-1 GIS, NG9-1-1 PSAP, ECRF, LVF, NG9-1-1 Additional Data and IoT. GeoComm regularly actively attends annual NENA events including the Standards and Best Practices (SBP) conference and Joint-Committee Meetings (JCM). GeoComm has been committed to NG9-1-1 standards and has long supported the development efforts and NENA Industry Collaboration Events (ICE) participation, as well as deploying NG9-1-1 solutions.

Regarding open source, GeoComm is a strong proponent of open source technology. Open source technology, used correctly, can enable greater solution capabilities, features, benefits, reliability, and cost advantages for end-customers, than 100% “from scratch” custom developed applications can. GeoComm’s 9-1-1 dispatch mapping solution includes over 50 open source components. GeoComm’s software engineering team follows a strict free and open source integration policy. All open source usage must be approved, documented, and tracked. Only well-known and well used open source packages are allowed. Open source license requirements are analyzed, and only certain open licenses are allowed. Specifically, with respect to open source GIS technology, some GeoComm applications, such as ECRF/LVF utilized open source GIS technology, specifically the PostGIS spatial data extensions for PostgreSQL.

### 5.5.2.1 User Experience

1. Display events using different icons based on class of service

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm’s dispatch mapping solution displays 9-1-1 calls using different icons that have been designed to reflect the type of 9-1-1 call. The 9-1-1 call type is defined in GeoComm’s parsing process which utilizes configured rules to determine the call type based on the class of service as well as other attributes as needed.

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2. Ability to toggle on/off individual and group layers

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution allows a user to toggle on/off individual layers. GeoComm's dispatch mapping solution supports group layers via dynamic map services, wherein group layers are rendered on the server side and delivered to the web application as image tiles.

In addition, while not a current Esri ArcGIS Portal or Online capability, Esri is planning to add client-slide group layer support to web maps, including configurability in an upcoming release of the Esri web map viewer slated for later in 2020 by Esri. GeoComm's roadmap plans to support client slide layer grouping once this support is added by Esri to web maps and supported in the ArcGIS 4.x JavaScript API.

3. Ability to perform location-based searching (i.e., search all visible layers based on current map extent or view)

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution supports search capabilities and the ability to search all visible layers will be delivered in a future release.

4. Ability to consume and display 3-D web services and hosted 3D databases

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap plans to include the ability to display 3D web services and hosted 3D databases. GeoComm has developed multiple proof of concept 3D GIS applications for public safety, including the Common Operating Picture map used by over 100 public safety agencies during Super Bowl LII. While GeoComm recognizes the value of and use cases for 3D mapping in

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public safety, GeoComm also recognizes there are challenges to be worked through before introducing 3D mapping for use by telecommunicators for typical geographies that city and county PSAPs work in. However, as part of GeoComm's Key Account Program, NCT9-1-1 is invited to collaborate with GeoComm on innovation and user experience related to 3D mapping for public safety. Via this proposal, GeoComm invites NCT9-1-1 to participate in such usability testing before the functionality is released, including by participating in GeoComm's 9-1-1 vertical test bed program.

5. Ability to interface Google Streetview and Pictometry (if available)

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap plans to support interfaces to Google Street View and EagleView Pictometry Connect. GeoComm welcomes NCT9-1-1's input on the design and priority of this functionality relative to other roadmap items as part of GeoComm's Key Account Program.

6. Ability to control transparency of boundary layers

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution allows the transparency of boundary layers to be configured in the map display.

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7. Ability to display location information in decimal degrees or degrees minutes seconds as defined by the user, for both cursor location and point and click location

- Complies  
 Complies Partially  
 Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution will display location coordinates for cursor location as well as allows a user to left-button mouse click on a location on the map to display the geodetic coordinates. The user will click and lock onto a location which provides a static set of geodetic coordinates which will not change until the user clears the pop-up or does another left-button mouse click at a different location on the map. The geodetic coordinates can display in latitude and longitude in decimal degrees, degrees minutes seconds, as well as degrees decimal minutes; the user can toggle between the different formats of latitude and longitude.

8. Create, save for reuse or training, and share temporary annotation such as parade routes (that expire after a set time) or street closures (indefinite expiry)

- Complies  
 Complies Partially  
 Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap plans to include functionality to allow authorized users to create, save for reuse or training, and share temporary annotation and geometry that have a start and end time, as well as items with unknown expiry. GeoComm welcomes NCT9-1-1's input on the design and priority of this functionality relative to other roadmap items as part of GeoComm's Key Account Program.

9. Ability to display and control IoT data, e.g., Waze, traffic cameras, and weather

- Complies  
 Complies Partially  
 Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution supports the ability to display and control visibility of IoT data.



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10. Ability to utilize commercially available routing and navigation capabilities

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution roadmap plans for routing and navigation functionality. As a result, this functionality will not be available at the time of NCT9-1-1's proposed implementation timeline. GeoComm welcomes NCT9-1-1's feedback on the design and priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program.

11. Ability to extend dispatch mapping capabilities to mobile devices for first responders

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution is built as a Progressive Web Application (PWA), as well as with responsive design to support multiple form factors, including workstation PC's, tablets and mobile devices. GeoComm's roadmap plans to enhance certain functionality that is valuable for first responder use cases using tablets and mobile phones.

**5.5.2.1.1 Map Application Interface**

NCT9-1-1 understands the challenges of deploying numerous mapping applications at the PSAP and in the field. NCT9-1-1 desires a solution that minimizes the number of mapping applications at the PSAP and mobile assets used by first responders. The mapping solution sought via this procurement activity also must offer, in addition to providing 9-1-1 Telecommunicators with a call-displaying map, one common operating picture (COP) for all other interfacing NG9-1-1-related applications. The respondent must propose a solution that offers the same benefits of a COP to emerging NG9-1-1 applications.

- Understood

Details to support the answer:

GeoComm's mapping solution has been designed to meet the requirements of the multi-discipline nature of emergency response, including 9-1-1 dispatch and law enforcement, fire and EMS response.



At NCT9-1-1's proposed time of implementation, the mapping solution will include a 9-1-1 call displaying map for telecommunicators and allow integration with CAD systems and AVL / device tracking to provide a real-time view of incident and first responder locations. GeoComm integrates with many CHE, CAD and AVL systems today and has APIs available to allow integration with any additional systems not integrated today, essentially creating a vendor agnostic mapping solution for mapping CHE, CAD and AVL data. Sharing functionality is available to configure which agencies and roles can see a shared view of which real-time data based upon agency and permission. These capabilities, along with a common up-to-date GIS dataset and views of situational data such as from Waze, traffic cameras and weather, provide a single COP mapping application for use in emergency response across disciplines, including in the PSAP and on mobile assets used by first responders.

#### **5.5.2.1.2 Single System View**

It is highly desirable that the components of the solution can be managed as a single system rather than as individual components. This is often referred to as a "manager of manager" capability when multiple platforms are involved. The respondent must describe how this is achieved or what it provides that mitigates the absence of a single-system view.

Understood

Details to support the answer:

GeoComm's dispatch mapping solution is a web-based application which provides a single system view.

#### **5.5.3 System Administration**

##### **5.5.3.1 Role-Based Configuration**

The PSAP map shall support role-based configuration and event-sharing capabilities. The role-based configuration setting shall include, but not be limited to:

- Symbology
- Default zoom level
- Visible zoom level for each feature
- Default features to be displayed

The event-sharing capabilities and role-based features must give PSAP telecommunicator the ability to visualize events for neighboring PSAPs. For example:

- PSAP A must be able to visualize events destined for PSAP C and D



- PSAP A must be able to hide events destined for all PSAPs except A, C, and D
- PSAP A must be able to decide whether its own events can be shared with other PSAPs, such as PSAPs C and D, but not PSAP B

The solution must offer the ability to spatially review and display 9-1-1 call logs. The review capability, at a minimum, should be capable of reviewing calls instantly for 12 previous hours, and provide the ability to pull historical call data into the application.

Understood

Details to support the answer:

GeoComm's dispatch mapping solution will support agency level configuration and event sharing at NCT9-1-1's stated implementation timeframe. For each agency, the map configurations can be set including default zoom extent, visible zoom level of features, default features to display, and symbology changes on layers not within the basemap. For each agency, event sharing can be configured to allow certain agencies or PSAPs to have access to their event data and not allow event sharing to any other agency that has not been given permission.

GeoComm's dispatch mapping solution will support display of active 9-1-1 calls for an agency for a configurable amount of time where these calls show on the map and in the list of active 9-1-1 calls. Further, it is planned in the roadmap to allow 9-1-1 call logs to be quickly accessible in the solution for an additional timeframe such as 12 hours. GeoComm welcomes NCT9-1-1's feedback on the design and priority of this functionality relative to other roadmap items as well as enhancements to current functionality as a part of GeoComm's Key Account Program.

## **5.5.4 Monitoring, Logging and Reporting**

### **5.5.4.1 System Report**

NCT9-1-1 requests that respondents propose solutions for a comprehensive, map-based, management-and-statistical-reporting functionality, to provide analytics in the form of reports to PSAP management personnel with real-time and historical information. The reports shall be user friendly and customizable, and the solution shall be capable of generating reports for varying time periods. The solution also shall be able to auto-schedule the generation and distribution of predefined reports. At a minimum, 9-1-1 call-detail reports (for record keeping and legal requirements) shall be readily available. The functions and reports shall include (at a minimum):

- ANI, PIDF-LO and address location or centerline geocoding statistics
- All calls based on service class or equivalent
- Heatmap functionality based on calls in a specified duration

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- Integration with NCT9-1-1's existing GIS enterprise suite (i.e., Esri ArcGIS Online, ArcGIS Portal)
  - Complies
  - Complies Partially
  - Does Not Comply

Details to support the answer:

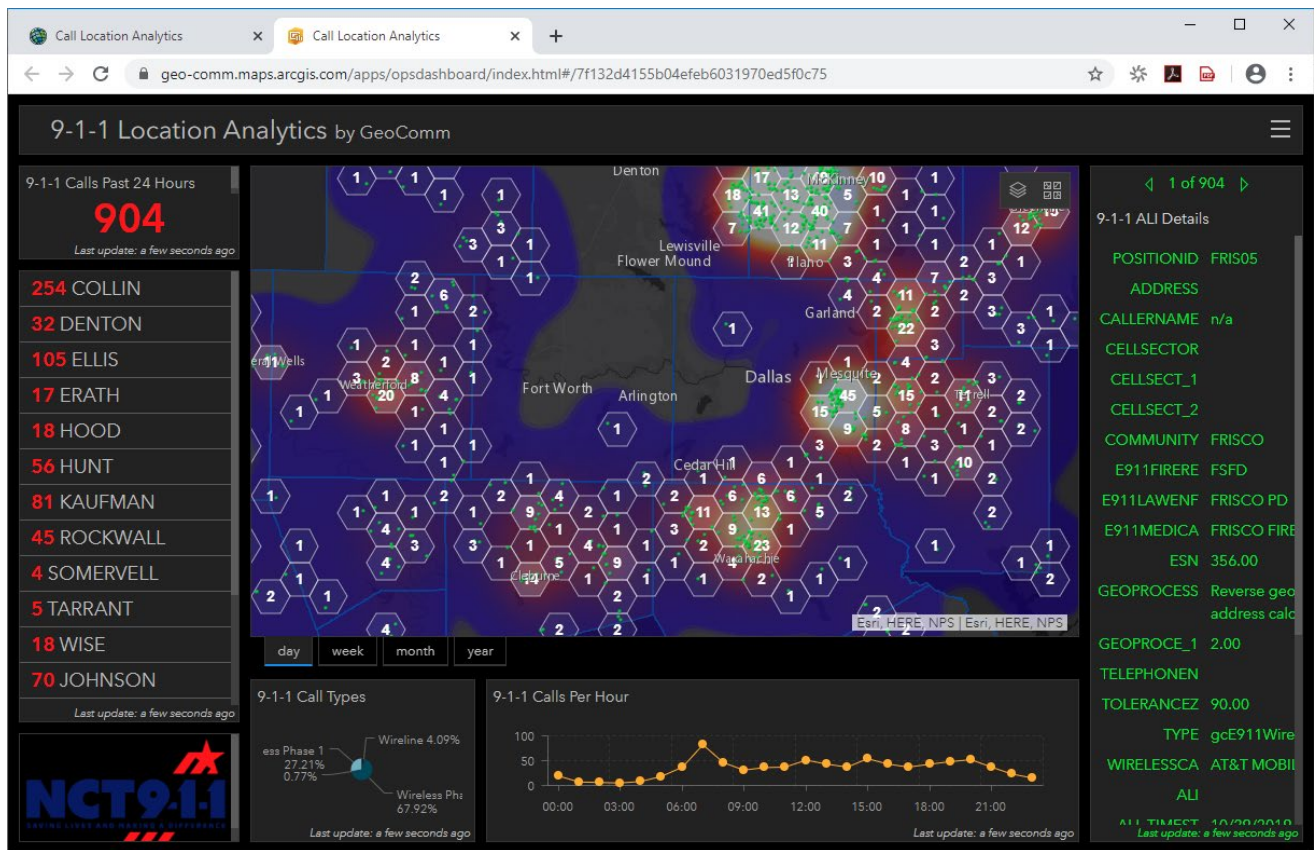
GeoComm will deliver services to configure an Esri ArcGIS Operations Dashboard application in NCT9-1-1's own ArcGIS Enterprise or ArcGIS Online Environment. GeoComm's cloud hosted dispatch mapping application will be configured to generate aggregated and summary data of 9-1-1 call activity once a minute and will dynamically update specifically designated feature services within NCT9-1-1's GIS organization. This location analytics feed is for dashboarding and reporting only and does not include license to use the feed for NCT9-1-1 to develop their own real-time desktop or mobile tactical mapping applications.

The proposed dashboard depicts 9-1-1 calls per day (hourly), week, month, and year. Because the ArcGIS Operations Dashboard will be configured inside NCT9-1-1's GIS enterprise, the dashboard is fully configurable and customizable by NCT9-1-1 staff. NCT9-1-1 staff can make multiple dashboards and can control which dashboards are available to which viewers based on ArcGIS Portal / Online sharing properties, named users, groups, and roles that may be configured by NCT9-1-1 staff.

No scheduled report generation, or email distribution of reports is required with this proposed solution as the dashboards are near-real time and distributed by the web browser-based operations dashboard.

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Following is an example of the proposed ArcGIS Operations Dashboard. Note that the example demonstrates caller location and geocoding statistics, call class of service breakdowns and stats, heatmaps of call activity, hexagonal binning of calls, call counts, and as described above, integration with NCT9-1-1 GIS Enterprise Suite (Esri ArcGIS Online, ArcGIS Portal).



#### 5.5.4.2 Map Discrepancy and Tracking of ALI, ECRF and PIDF-LO Data

NCT9-1-1 further requests that respondents propose solutions within the NG9-1-1 web-based enterprise mapping solution to allow each user to log discrepancies and track the discrepancies to completion. The expected turnaround for critical layers (such as roads and address locations) is two business days. The turnaround for non-critical layers (such as parks or landmarks), is potentially four weeks. Respondent must demonstrate that the discrepancy-tracking solution continually complies with NG9-1-1 development and standards compliance. The web-based mapping application must be able to create and track ALI, PIDF-LO and some NG9-1-1 system-related errors. Respondent must demonstrate how the discrepancies are captured and tracked with spatial reference. NCT9-1-1 desires to coalesce the captured errors and share them via a web-based system.

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- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's integrated GIS data management platform contains a standardized Discrepancy Reporting mechanism as defined in NENA-STA-010.2-2016 to receive Discrepancy reports from agencies and Functional Elements. The captured errors can be shared via GeoComm's Contributor application, a web-based application providing GIS data management capabilities including queueing, prioritizing, and managing discrepancies (amongst other capabilities). Enabling the ability to create and track ALI, PIDF-LO, and other NG9-1-1 system-related errors in GeoComm's dispatch mapping solution are on the roadmap. Similar to GeoComm's Contributor product UI which is being tested by NCT9-1-1 today, users will be able to create a report from a map display providing spatial reference within the report. This is to bring UI and functionality consistency across GeoComm's integrated GIS solutions to simplify and improve customer experience. (image of Contributor UI below for reference)





### 5.5.4.3 Solution Monitoring

The solution must have system monitoring/logging/discrepancy reporting capabilities necessary to support troubleshooting and ongoing operations and maintenance. Respondent must describe all capabilities available with the solution. If the solution does not provide a single-system view, then a description for each component is required. The following are of particular interest, but this is not an exhaustive list:

- Notification – e.g., web-based, email, SMS
- Alarm levels – e.g., critical, major, minor
- Alarm-threshold setting to reduce the number of minor alarm notifications
- System logs
- It is desirable to have a minimum of 180 days available online
- Filtering and sorting
- Archiving

In addition to the standalone capabilities, the respondent must describe its ability to interface with other management systems using standard protocols, such as Simple Network Management Protocol (SNMP) or Common Management Information Protocol (CMIP).

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm utilizes monitoring and logging solutions which capture logs and notify support of issues detected within the solution. Notification is provided to support via SMS and email. Solution logging capabilities are centralized for GeoComm support personal which include alarm level categorization and filtering to provide thresholds to assist in troubleshooting and the escalation of notifications to GeoComm support. A customer facing system availability dashboard is available to observe solution and service availability status.

### 5.5.5 GIS Data Management

Respondent must indicate its strategy for updating the operational layers, dynamic services, basemap services, geoprocessing services, geocoding services, GIS layers and all other web services that rely on NCT9-1-1's enterprise production GIS maintenance workflows. NCT9-1-1 will provide the selected respondent with access to its data center where NCT9-1-1's GIS team will store relevant GIS data. Each respondent is required to detail its plan to provide access to the data locally at each PSAP. Solutions



must not include local PC storage of GIS data or a map cache. NCT9-1-1 maintenance workflow is shown in Figure 1.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution is a complete public safety GIS and mapping solution managed by GeoComm. Vector GIS data updates are processed via GeoComm GIS Data Hub and the updates are propagated to map, feature, basemap, and geocoding services to support relevant operational layers, dynamic services, basemap services, geoprocessing services, geocoding services, GIS layers and other web services using NCT9-1-1's enterprise production GIS. Raster data updates for imagery are handled either by NCT9-1-1 (or imagery provider) or optionally provided to GeoComm's dispatch mapping solution to be hosted as a file upload process. If imagery services are hosted by NCT9-1-1 (or imagery provider), they must be publicly accessible at the time of implementation. GeoComm understands NCT9-1-1's current enterprise production GIS maintenance workflows as it relates to dispatch mapping and GeoComm will work collaboratively to ensure a successful transition to workflows to support the new dispatch mapping solution. GIS Data Hub provides data validation and transformation of NCT9-1-1's GIS data to formats optimized for use in GeoComm's dispatch mapping solution. This approach is similar to the GeoComm ECRF GIS data provisioning process and allows the GIS data updates process to be aligned between GeoComm's ECRF and dispatch mapping solution.

GeoComm's dispatch mapping solution web services are securely accessed at each PSAP where the dispatch mapping web application runs in a web browser. The GIS data accessed through web services are managed centrally by GeoComm. GIS data and map caches are not stored at the PSAP or on the local PC storage. As GIS data updates finish publishing to the dispatch mapping solution web services, they become available to NCT9-1-1 users, such as telecommunicators, of the solution. Map updates are generally realized by end users simply by panning or zooming the map or refreshing the page in the web browser.

#### **5.5.5.1 Integrated with NCT9-1-1 Enterprise GIS**

NCT9-1-1 desires the mapping solution to integrate with its GIS environment, thereby enabling GIS personnel to troubleshoot mapping errors reported by 9-1-1 telecommunicators. Respondent must demonstrate the ability to work with web features services and cooperatively with other web application programming interfaces (APIs).

- Complies





- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's proposed dashboarding and reporting system will configure an ArcGIS Operations Dashboard inside NCT9-1-1's existing ArcGIS Enterprise Portal or ArcGIS Online environment. The dashboard will have the ability to map and chart a 9-1-1 summary telemetry feed from GeoComm dispatch mapping solution, which updates web feature services dynamically and plans to use the ArcGIS REST and Python APIs. This provides NCT9-1-1 GIS personnel with direct access and insight into 9-1-1 mapping system performance.

#### 5.5.5.2 Caching of Basemap

Respondent must indicate its strategy for updating the basemaps including raster and vector data. NCT9-1-1 desires a solution whereby a change-detection process runs and caches updates nightly.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution uses Esri-based vector tile services for the cached basemaps to represent vector data, including road centerlines, site/structure address points, municipal boundaries and unincorporated boundaries. Currently, Esri-based vector tiles require a full update each time they are built and GeoComm will immediately start the process to build vector tiles with each map data update. However, this process will run separate from the update of operational layers to ensure there is no delay in making the map data updates available for mapping, querying, and geocoding in the dispatch mapping solution. Vector tile services will be updated once the vector tiles have been rebuilt in a manner that does not impact the dispatch mapping solution with ongoing telecommunicator sessions. Raster data, such as imagery, if hosted by NCT9-1-1 (or imagery provider), will require processes to ensure that the raster data basemaps are available and do not impact the GeoComm dispatch mapping solution with ongoing telecommunicator sessions. If raster data basemaps are optionally hosted by GeoComm for use in basemaps, then they are cached as ArcGIS map services. Updates to basemap caches for raster data, if optionally hosted by GeoComm, are currently handled on a case by case basis and will be evaluated at the time to determine the appropriate method to update the basemap cache, whether by updating only the area(s) with the changes or building a full cache; whichever method of updating the raster data basemap, the updates are done in a manner to not impact the dispatch mapping solution within ongoing telecommunicator sessions. Vector data will be



overlaid on raster data, such as imagery, to create a multi-layer basemap with the raster data (i.e. imagery) map service on the bottom layer. The vector data will be a vector tile service using transparency on boundary and polygon layers to give the effect of showing layers like road centerlines and address location points with their labels on top of imagery.

### 5.5.5.3 Update of Operational Layers

NCT9-1-1 maintains the production GIS databases and requires that all operational layers be capable of near-real-time updates from the production GIS interface and/or SI. The address location point layer, the road centerline layer and other mission-critical layers identified by NCT9-1-1 must be updated within one minute of being updated in NCT9-1-1's production GIS environment. Respondent must propose a solution that derives its updates through the interface. Core map layers and additional map layers may be updated frequently, and the solution must offer tools and options to schedule additional automated updates from the centralized server.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GIS data updates, including address location point layer, road centerline layer, and other mission-critical layers are utilized and provided via GeoComm GIS Data Hub. GIS Data is provisioned to the GeoComm solution via GIS Data Hub and hosted by GeoComm in its cloud. This requires updates be processed by GIS Data Hub where QC checks are completed, and the geocoders are built before being provisioned to the application. GeoComm application can be configured to check for updated data on a regular basis, however these processes take longer than one minute.

As an alternative option, and as part of negotiations, NCT9-1-1 could host the data and web map services, though this alternative approach significantly impacts the technical requirements as they relate to GeoComm's offering. In this scenario, the mapping system would connect directly to NCT9-1-1's environment and consume web feature services published by NCT9-1-1. This would provide instant access to the GIS updates as completed by NCT9-1-1. In this scenario, NCT9-1-1 would be responsible for the reliability and scalability of the GIS data and web feature services.



#### 5.5.5.4 Updating of Operational Geoprocessing Services

Respondent must propose a solution that offers minimum changes to NCT9-1-1 existing GIS maintenance workflows shown in Figure 2 above.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution fits into NCT9-1-1's existing GIS maintenance workflows as the process to update the GIS data in the dispatch mapping solution is identical to the process for NCT9-1-1's current ECRF GIS provisioning with the exception of additional GIS layers needed for dispatch mapping.

#### 5.5.5.5 Updating of Operational Geocoding Services

NCT9-1-1 requires that all geocoding services be built by the respondent and be driven by data from operational layers that receive near-real-time updates from the NCT9-1-1 production GIS environment and/or SI. Critical layers, such as the address location point layer and road centerline layer, must be updated within five minutes of being updated in the NCT9-1-1 production GIS environment and provisioned to a mechanism such as an SI. Respondent must propose an automated solution for the geocoder update process. The automated geocoding service updates must be performed from a centralized server.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm has automated the building of geocoding services for our mapping solutions utilizing GIS Data Hub, which is currently in use by NCT9-1-1. While currently available with GeoComm's desktop mapping application (Dispatch Map), GeoComm's proposed web-based dispatch mapping solution will not support automatic updates in time to meet NCT9-1-1's proposed deployment schedule. Once supported, NCT9-1-1 will be able to leverage the value of GeoComm's integrated GIS solutions utilizing GIS Data Hub to update the ECRF and mapping application simultaneously to ensure GIS data alignment across those systems.



## 5.5.6 Industry Standards

### 5.5.6.1 NG9-1-1 Data Model Support

The proposed solution must incorporate specific application requirements and the cartographic design elements necessary to produce rich, multiscale basemaps and operational layers. Respondent must indicate its strategy for keeping abreast of the evolution of Esri's NG9-1-1 data models per industry standards, as well as ad hoc changes to data schemas made by NCT9-1-1.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution utilizes Esri's latest technology to provide rich cartographic design, multiscale basemaps, and operational layers within the map for telecommunicators. GeoComm works closely with Esri as a Platinum Business Partner to stay abreast of ArcGIS technology and roadmaps, including monthly calls with an appointed Technical Advisor, as well as attending events including Esri Developer Summit and Esri UC.

GeoComm actively participates in NENA workgroups and events, including in leadership roles, related to NG9-1-1 i3 architecture, NG9-1-1 PSAP, NG9-1-1 Additional Data, IoT and NG9-1-1 GIS related workgroups. GeoComm regularly actively participates in annual NENA events including the Standards and Best Practices (SBP) conference and Joint-Committee Meetings (JCM). These different settings include work on various types of NG9-1-1 data models as defined in standards relating to GIS, United States Civic Location Data Exchange Format (CLDXF), Additional Data related data models and many other i3 defined data models. This participation allows GeoComm to stay abreast with forthcoming changes and contribute in the development of standards and best practices based on GeoComm's nearly 25 years of 9-1-1 GIS experience.

GeoComm's dispatch mapping solution utilizes GIS Data Hub which transforms the data model of the data provided by NCT9-1-1 and what is used in the dispatch mapping solution. This approach allows data model changes by NCT9-1-1 to be updated in GIS Data Hub configuration without further delay for continued map data updates into the dispatch mapping solution.



### 5.5.6.2 NG9-1-1 Industry Collaboration Events

NCT9-1-1 recognizes benefits of NENA's NG9-1-1 Industry Collaboration Events (ICE). Please address the questions listed below. It is NCT9-1-1's belief that respondents which participate in ICE are more likely to detect and correct interoperability issues at an earlier stage in system development.

With the full understanding that ICE, under current guidelines, are not intended to score the performance of the participants, responses to the following questions are required:

1. Which NENA NG9-1-1 ICE has your company participated in?

GeoComm participated in ICE1, ICE2, ICE3, ICE4, ICE7, and ICE8. ICE5 and ICE6 did not test any elements for which GeoComm has products.

2. Which of your products did you test at the event(s)?

ECRF, LVF, Forest Guide, i3 logging.

3. Have you tested all of the products you are proposing in your response at the events?

No.

4. If not, which products have you not tested?

GeoComm has not tested 9-1-1 Dispatch Mapping or SI at any ICE event.

5. If you have not participated in the events and/or not tested the products proposed, please explain your reason for not participating and/or testing.

We participate in all relevant ICE events that test products GeoComm makes and sells. To date there have not been any ICE events testing 9-1-1 Dispatch Mapping, 9-1-1 GIS Data Management Applications, or Spatial Interface.

6. Which, if any, of your proposed products had interoperability challenges with any other ICE participants, and what mitigation strategy(ies) might be used to address these interoperability issues?

Not applicable, there have not been any ICE events testing interoperability of 9-1-1 Dispatch Mapping and/or SI.

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7. Do you intend to participate in future events? If so, which ones? If not, please explain

GeoComm will participate in future events for solutions we offer. At this point, there is only one planned future event, and it was announced on March 13, 2020. It is not a traditional event and is being called “the first trans-continental interoperability testing event for next-generation NG9-1-1 and NG112 emergency calling”. There are no additional details, schedule, or scope yet, so GeoComm cannot confirm or reject intent to participate. However, the high-level overview of the event does not specifically include 9-1-1 dispatch mapping or SI.

### 5.5.7 External Interfaces

#### 5.5.7.1 Integration with CHE and NCT9-1-1 Enterprise GIS

All PSAPs in the NCT9-1-1 region utilize the same Call Handling Equipment (CHE). NCT9-1-1 has implemented a CHE with the Comtech Solacom Guardian Platform. NCT9-1-1 is running on 19.x software version and i3 Logging Service is used to pass data to other FEs. This method is an interim solution until EIDO with an IDX is ratified in standards.

Understood

Details to support the answer:

GeoComm understands NCT9-1-1’s current CHE environment and what is required to integrate with the Comtech Solacom Guardian Platform. GeoComm has experience integrating with the Guardian Platform and its i3 Logging Service to process and map 9-1-1 calls in real-time to telecommunicators at multiple large multi-PSAP deployments in the US for more than five (5) years.

#### 5.5.7.2 Additional Services Integration

The NG9-1-1 web-based enterprise mapping solution should be capable of providing telecommunicators with access to additional services, data and valuable information.

PSAPs in North Central Texas also receive communications to 9-1-1 via transport media other than telephone. Respondent must demonstrate a strategy for geographically displaying text messaging received by the PSAP. Respondent must demonstrate a strategy for integrating the mapping solution with other web-based interfaces, such as chat sessions and push-to-talk applications, and other ADR-generated data. Respondent must demonstrate a strategy for delivering and mapping cell phone images and videos to the PSAP call-taking workstation.

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The solutions must have a method of retrieving, processing and utilizing information in addition to that received with the call. NCT9-1-1 requests respondents to detail what additional information, as covered in the NENA i3 Technical Requirements Document (cf. i3 TRD, 4.1.5).<sup>2</sup>

Data provided to the PSAP in addition to that received with the call must be acquired, utilized and presented in the mapping solution as appropriate. References for additional data resources can be found in the NENA i3 Technical Requirements Document (cf. i3 TRD, 4.2.10 through 4.2.13).

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm's dispatch mapping solution has been designed to provide telecommunicators with additional services, data, and valuable information related to 9-1-1 calls, callers, and the incident location with an optimal user experience. The dispatch mapping solution has been built to map and display SMS text-to-911 call locations from CHEs.

The dispatch mapping solution roadmap plans to include:

- Support for SMS text-to-9-1-1 calls from NG9-1-1 PSAP functional elements via EIDO
- Integrate to NG9-1-1 standardized methods, such as ADRs, and proprietary web API integrations to map and display 9-1-1 call, caller and location additional data
- Support NG9-1-1 multimedia calls to display the device location and provide access to content such as images and videos on the map

GeoComm's dispatch mapping solution will query the RapidSOS Clearinghouse for supplemental caller location information to display on the map with each 9-1-1 call mapped. GeoComm's dispatch mapping solution roadmap plans to support RapidSOS Clearinghouse additional data (i.e. ADR-generated data) and other additional data sources based on the phone number or other identifier associated with the device calling 9-1-1. The data provided to the PSAP, in addition to that received with the call, is acquired and utilized in the dispatch mapping solution to display and present appropriate data to the telecommunicator.

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<sup>2</sup> [https://cdn.ymaws.com/www.nena.org/resource/resmgr/Standards/NENA\\_08-751.1\\_i3\\_Requirement.pdf](https://cdn.ymaws.com/www.nena.org/resource/resmgr/Standards/NENA_08-751.1_i3_Requirement.pdf)



### 5.5.8 Security

Respondent must demonstrate the following security processes:

- Data security
- Network security

It is a requirement that the proposed system must incorporate monitoring that will detect abnormal traffic indicative of a security problem, such as a breach or compromised system. Respondent must describe how its proposed solution will meet this requirement.

Respondent's solution must comply with the appropriate sections of the current version of NENA's NG-SEC standard and deploy industry best practices to close any gaps. Respondent must describe its security measures, indicating compliance with NG-SEC and where industry best practices are utilized.

Respondent must describe its overall approach and philosophy to data encryption and how it will be implemented as a current and future capability.

- Complies
- Complies Partially
- Does Not Comply

Details to support the answer:

GeoComm is responsible for protecting the application, data, and infrastructure that runs all services for the GeoComm dispatch map solution within the cloud. This infrastructure is composed of the hardware, software, data, and networking. GeoComm will work with NCT9-1-1 on components of the solution which are located within NCT9-1-1's environment around physical access, overall system security design, and general system infrastructure security, where GeoComm is informed and/or consulted on such elements.

The proposed security measures are meant to be adopted as part of a larger security program to ensure complete system security for the comprehensive solution. GeoComm uses NENA security standards and the NENA Next Generation 9-1-1 Security (NG-SEC) Audit Checklist as a baseline for system design. The proposed solutions are based on current NENA NG9-1-1 security standards. NCT9-1-1 security standards which differ from NENA NG9-1-1 security standards will be handled via design negotiations and standard change control processes.

All end to end communication is encrypted using TLS. All hosted endpoints of the GeoComm cloud hosted dispatch mapping solution require an HTTPS connection. Data is encrypted in transit and at rest.





## 5.5.9 Solution Architecture and Performance

### 5.5.9.1 Solution Architecture Design Requirements

NCT9-1-1 manages a virtual private server (VPS) environment for all applications that support the NG9-1-1 system. The server architecture is built on the Cisco Unified Computing System architecture with fiber channels to a storage-area network (SAN) for the two data centers. As such, the NG9-1-1 web-based mapping application solution is required to collocate in NCT9-1-1's VPS environment if an owned-and-operated solution is proposed. Respondent must indicate the design strategy for providing redundancy at NCT9-1-1's two data centers and ensuring map availability at all PSAPs. Further, the respondent is required to demonstrate its strategy for offline map display in the event a workstation loses network connectivity. NCT9-1-1 desires a solution that leverages NCT9-1-1's Esri licenses. The system architecture design strategy and pricing must show options that leverage NCT9-1-1's Esri enterprise/cloud and desktop licenses. NCT9-1-1's Esri licensing consists of the following:

- ArcGIS Desktop
  - ArcGIS Pro
  - ArcGIS Enterprise (Server, Portal, Data Store, Web Adaptor)
  - ArcGIS Online
  - ArcGIS GeoEvent Server
- Complies  
 Complies Partially  
 Does Not Comply

Details to support the answer:

GeoComm requires one (1) essential server with connectivity to the internet to access cloud-hosted APIs at each data center. The servers can be provided using the IT infrastructure described above.

GeoComm requires NCT9-1-1 to provide diverse paths from NCT9-1-1's ESInet and core datacenters to the internet and externally hosted components. These connections and associated components within the critical path should be redundant and monitored. GeoComm's system uses heartbeats and connection messages to validate internet connections from the data centers are available. The proposed solution does not offer an offline map display.

A limited amount of map views for previous locations visited within the dispatch mapping solution at each workstation will be available in the web-browser cache.

The system will leverage NCT9-1-1's Esri ArcGIS Online Organization's GIS services that are shared publicly and will also leverage content publicly available in Esri ArcGIS Online. GeoComm will continue to leverage NCT9-1-1's ArcGIS Enterprise and GeoEvent Server. If imagery services for use in GeoComm's dispatch mapping solution are hosted by NCT9-1-1, which utilizes NCT9-1-1's existing Esri licensing, then they must be publicly accessible.



### 5.5.9.2 Solution Speed

The solution must provide an acceptable, quantifiable response when a specified number of users per PSAP (such as half the number of workstations in each PSAP) and total users (such as half the number of workstations deployed in total) are actively querying the map over the available network links.

Understood

Details to support the answer:

GeoComm's cloud hosted dispatch mapping solution is highly scalable and highly performant, meets fluctuating demand, and provides real-time event data processing for 9-1-1 calls using a cloud native serverless architecture that scales automatically as required based on load. The benefit of this architecture is that the solution speed does not vary based upon the number of users or workstations.

Elements that will influence solution speed include, local bandwidth, network design and GIS data layout. During system configuration a performance baseline will be established for monitoring and to compare any changes against.

Ongoing monitoring will ensure that the overall solution remains performant and that the end-user experience at each PSAP is not affected. GeoComm uses tools to measure and monitor performance of the solution. System Administrator training will include information on these tools.

### 5.5.9.3 Network Connectivity

Respondent must provide a high-level design diagram of its solution. SaaS solutions must identify how the connectivity will leverage different data center geographical regions and incorporate direct connections and VPN connections over the public internet to cloud providers (SSL3 connections on whitelist are acceptable).

All network requirements must be detailed in the respondent's proposal. No special accommodations will be made for network connectivity once a contract has been awarded.

Understood

Details to support the answer:

GeoComm's dispatch mapping solution is hosted on multiple public cloud data centers in different geographical regions. The real-time data processing for 9-1-1 calls is hosted in AWS GovCloud West in three different data centers located in separate availability zones. GeoComm's GIS data services

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<sup>3</sup> Secure Sockets Layer.

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are hosted in AWS in two different public cloud data centers located in separate availability zones. All traffic is secured with FIPS 140-2 compliant connections.

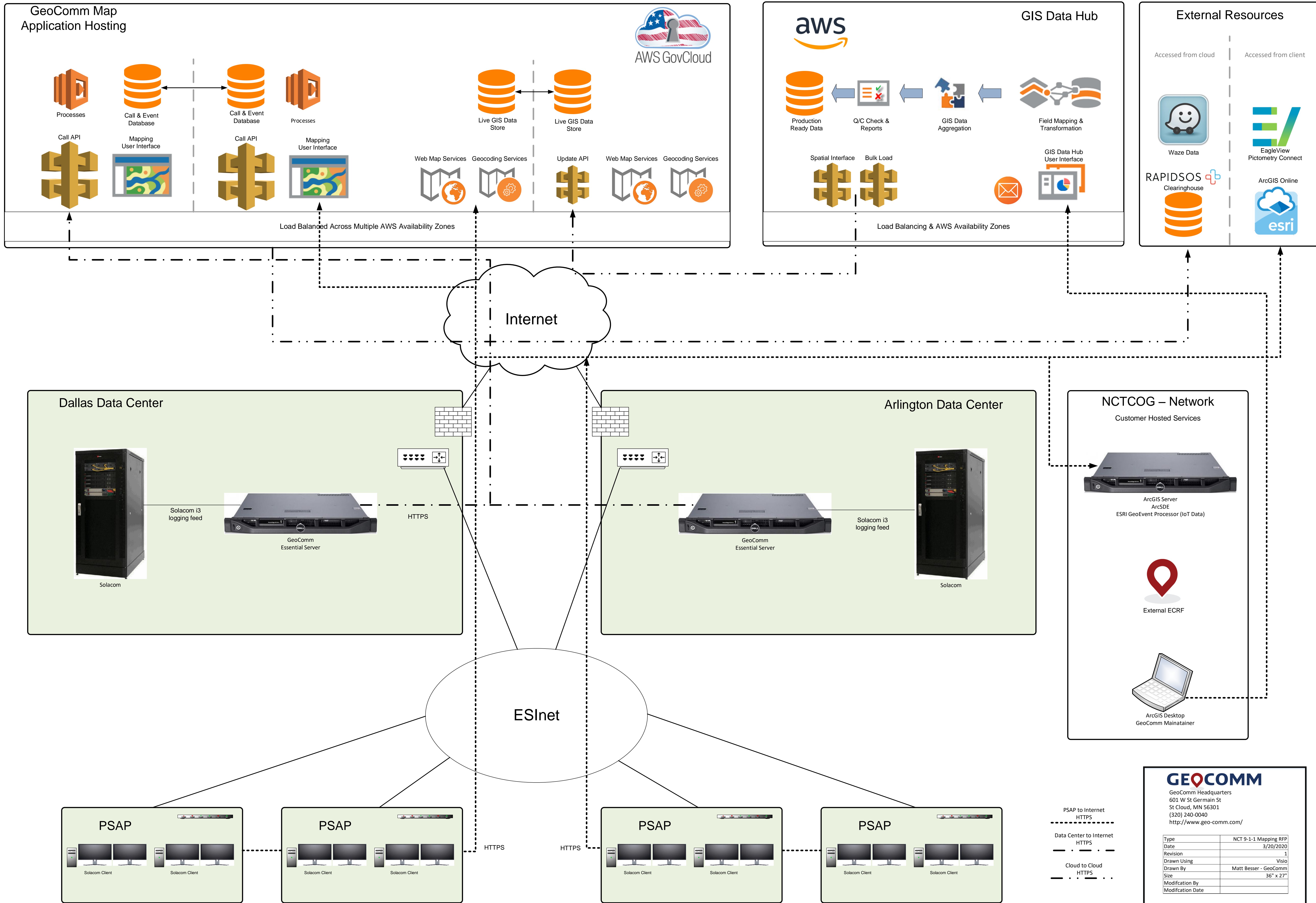
GeoComm's dispatch mapping solution relays information from NCT9-1-1 servers and GeoComm software located within NCT9-1-1's environment to the GeoComm dispatch mapping cloud hosted solution. The GeoComm on-premise software installed on servers within NCT9-1-1's environment will make outbound HTTPS requests to endpoints hosted by GeoComm in the cloud.

NCT9-1-1 must allow outbound HTTPS traffic to a subset of GeoComm dispatch mapping solution API endpoints that are hosted by GeoComm in the cloud. NCT9-1-1 is not required to configure incoming network ports. Hostnames for whitelisting GeoComm's dispatch mapping solution will be provided to NCT9-1-1 during project design and initiation.

If GeoComm's dispatch mapping solution is going to consume any services hosted by NCT9-1-1 (or other provider), then these services must be publicly accessible.

The system design is depicted on the following page.

# NCT 9-1-1 - GeoComm Cloud Mapping



**GEOCOMM**  
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Type	NCT 9-1-1 Mapping RFP
Date	3/20/2020
Revision	1
Drawn Using	Visio
Drawn By	Matt Besser - GeoComm
Size	36" x 27"
Modification By	
Modification Date	



## 5.5.10 Application Support and Maintenance

### 5.5.10.1 Esri Add-On Components / Software Release Strategy and Roadmap

Respondent must indicate its strategy for keeping abreast of the evolution of Esri web mapping and API developments, and provide examples from previous experience that demonstrate the respondent's commitment to improving NG9-1-1 web-based mapping functionalities.

Understood

Details to support the answer:

GeoComm is a Platinum Esri Business Partner which allows for many interactions that keep GeoComm abreast of the evolution of Esri technology and web mapping and API developments, including an assigned Esri Technical Advisor and Premium Support Manager who GeoComm meets with regularly to both be informed and collaborate on current projects. GeoComm regularly sends development and product management staff to Esri conferences, including the Esri Developer Summit. GeoComm's VP of Innovation, serves on Esri's CTO advisory board, giving GeoComm advanced insight, input, and influence into Esri product roadmaps.

GeoComm has a long track record of enhancing our dispatch mapping solutions to embrace next generation mapping functions in 9-1-1 and examples of this follow.

- GeoComm's GeoLynx Server dispatch mapping solution included a map-based tool for retrieval of LoST listServicesByLocation to show emergency service agencies at a given location on the map.
- GeoComm's GeoLynx Server supported retrieval of supplemental caller locations from the RapidSOS Clearinghouse LIS via the HELD protocol.
- GeoComm partnered with NCT9-1-1/NCTCOG, RapidSOS and Google to do early 2D indoor pilot testing in December 2016 at Frisco, TX and Android ELS Pilot Project in January 2018.
- GeoComm has also been a thought leader and innovator in the creation and use of 2D indoor GIS, as well as 3D indoor GIS to display accurate indoor and vertical locations.
- GeoComm provided the Common Operating Picture 3D platform used by over 100 public safety agencies for Super Bowl LII which provided 3D detailed exterior and interior GIS with using Esri ArcGIS technology as well as GeoComm 3D geocoding and location technology to accurately display incidents and responder locations.

GeoComm's dispatch mapping solution is planned to have quarterly releases which introduce enhancements and new functionality to meet the needs of the ever-changing requirements of public safety and emergency response. Defect fixes and backend improvements will be released as soon they are validated and available within GeoComm's dispatch mapping solution. GeoComm's release management process utilizes best practices and uses an industry leading tool to manage the deployment of updates to each component of the overall solution that includes automated testing during the release management process.



### 5.5.10.2 NCT9-1-1 Services Roadmap

NCT9-1-1 desires to procure a solution that offers a platform that is easy to upgrade and aligns with NCT9-1-1's roadmap and Esri's software releases. Additionally, NCT9-1-1 requires a widget/application add-in option whereby NCT9-1-1 developers can use Esri APIs and/or the respondent's API to build custom application functionality to add to the i3 NG9-1-1 web-based enterprise mapping application as widgets or add-in applications. NCT9-1-1 could develop and implement add-in functionality such as weather overlays and local preplan viewers. Respondent must demonstrate the ability to work cooperatively with NCT9-1-1 and to assist NCT9-1-1 regarding widgets and add-in application integration.

Understood

Details to support the answer:

GeoComm's dispatch mapping solution is fully managed by GeoComm and is built as a SaaS solution that is rapidly upgraded as a whole solution for all customers with minimal impact on NCT9-1-1 while staying current with Esri software releases.

GeoComm understands NCT9-1-1's desire to innovate and develop widgets or application add-ins with the dispatch mapping solution. However, at the time of implementation there will not be any planned ability for custom integration. GeoComm's roadmap has plans to allow development access to APIs, as well as the ability to link out to custom viewer apps from the dispatch mapping solution. The link functionality, for example, could be used to open a 3D web scene web application by generating a clickable URL link comprising the URL to an ArcGIS WAB application built and populated with widgets managed by NCT9-1-1 GIS staff, and URL query parameters including the latitude, longitude, and elevation or the caller that the WAB application and widgets could use to zoom the 3D map to the correct building and location.

### 5.5.10.3 Benefits Derived from Partners

Respondent must state the benefits derived from partnerships with other companies that are part of its response. This might include such items as standards compliance, level of experience and previous partnering arrangements that were successful. Special attention should be given to how these benefits may influence early adoption of NG9-1-1 requirements by network providers. Examples of areas that may be included are as follows:

1. Participation in addressing new requirements of service order input (SOI) structure and/or interface
2. ALI/master street address guide (MSAG) update interface to ESInet functions

Understood

Details to support the answer:



## Esri Platinum Partnership

GeoComm is an Esri Platinum Partner (one of less than 20 globally, out of Esri's partner program comprising thousands of partners). GeoComm's Platinum Partnership with Esri directly benefits GeoComm end customers such as NCT9-1-1 by providing:

- Complex systems design and integration support: For example, in the past, Esri provided GeoComm with direct support for integrating GeoComm 9-1-1 mapping systems into NCT9-1-1's complex multi-versioned geodatabase environment
- Advanced and priority technical support: If a technical support case involves an Esri component, GeoComm can jump to the head of the support queue, and immediately escalate cases to advanced engineering support within Esri, leading to faster case resolutions for mission critical 9-1-1 customers.
- The ability to compel Esri to hotfix Esri products: For example, during the run up to Super Bowl LII, GeoComm discovered a security flaw in ArcGIS GeoEvent Server that could potentially expose the current location of public safety and security team leaders and VIP's to bad actors. GeoComm escalated the case within Esri and obtained a critical hotfix to the Esri platform closing the security gap prior to the event.
- Early access, and practical domain focused exploration of new Esri technology: GeoComm routinely gains early access to new Esri technology and works directly with Esri in testing the new technology in 9-1-1 domains. For example, a new Esri technology that may become useful to NCT9-1-1 is ArcGIS Analytics for IoT, a new ArcGIS Online capability that may be useful for calculating real-time location analytics for 9-1-1.

## AWS Select Technology Partnership

GeoComm is an AWS Select Technology partner in public safety, providing GeoComm exclusive access to AWS solution and security experts to maximize AWS technical capabilities within the GeoComm dispatch mapping solution. The Select partner status requires rigorous view by AWS staff of the partner company and solutions and use of AWS cloud technology, and partner staff with AWS technical certifications. Specific benefits to end customers like NCT9-1-1 include:

- Confidence that GeoComm has extensive experience building and deploying our solutions that are built on and integrated with AWS.
- Amazon verification that GeoComm provide well-architected AWS based solutions for our customers.
- Access to priority Amazon AWS engineering and technical support



## **RapidSOS Partnership**

GeoComm partners with RapidSOS, providing advanced capabilities, support, and research and development. For example, GeoComm's vertical 9-1-1 testbed application can display 3D caller locations obtained from the RapidSOS clearinghouse inside of a 3D web scene hosted in ArcGIS Enterprise Portal / Online. GeoComm production tactical mapping application are one of the largest consumers of RapidSOS location data in the United States.

## **Solacom Partnership**

GeoComm partners with NCT9-1-1's current CHE provider, Solacom (a subsidiary of Comtech Telecommunications Corp.), at several other GeoComm customer sites with similar numbers of total stations as NCT9-1-1. GeoComm works with Solacom on ongoing projects, as well as partner discussions, including discussions related to adoption the of NG9-1-1 technologies, including EIDO. GeoComm also partners with many other CHE and CAD companies.



## Tab E

## References

GeoComm's experience serving local, regional, and state governments is extensive. We have been dedicated to providing public safety 9-1-1 GIS mapping and GIS solutions to state, regional, and local governments since our inception in 1995. Since that time, we have gained a national reputation as a leading provider of public safety GIS mapping software and GIS services.

GeoComm has extensive experience working with clients similar in size to NCT9-1-1 to successfully execute regional PSAP mapping software deployments. Our experience is unrivaled in the industry; we have amassed a deep breadth of knowledge, expertise, and proven success not found elsewhere.

The following client references are a sampling of our regional mapping systems and highlight our successful, long-term relationships with each client.

### Mid-America Regional Council (MARC)

The Mid-America Regional Council serves the nine-county Kansas City metropolitan area, which includes 119 separate city governments, encompassing 44 PSAPs. MARC has been a customer with GeoComm for the past 19 years, first contracting with GeoComm for services in 2001. Presently, MARC uses a GeoLynx Server Dispatch Mapping system with 219 positions. MARC has been a GeoComm mapping customer since 2006, converting to GeoLynx Server in 2017. In 2018, MARC received approximately 1.55 million 9-1-1 calls.

In addition, MARC utilizes GeoComm Maintainer software for ongoing GIS data creation and editing tasks. Further, GeoComm provides MARC annual GIS data maintenance services.

#### Customer Contact

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## Association of Central Oklahoma Governments (ACOG)

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The 9-1-1 Association of Central Oklahoma Governments (ACOG) is an intergovernmental entity formed in 1988 to implement, administer and coordinate the operation of the regional 9-1-1 emergency communication service in Central Oklahoma, serving 22 PSAPs. ACOG has been a 9-1-1 dispatch mapping customer with GeoComm for over 13 years, first contracting with GeoComm for mapping software in 2006. Presently, ACOG uses a GeoLynx Server Dispatch Mapping system with 73 positions. In 2018, ACOG received approximately 550,000 9-1-1 calls.

In addition, GeoComm is the region's GIS data maintenance provider, providing ongoing GIS data maintenance and annual GIS data report card services. ACOG also utilizes GeoComm maintainer for GIS data creation and editing tasks.

### Customer Contact

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Telephone: (405) 778-6138

## Capital Area Emergency Communication District (CAECD)

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The Capital Area Emergency Communications District (CAECD) administers the regional 9-1-1 system for 10 central south Texas counties, encompassing 31 PSAPs. Presently, CAECD uses a GeoLynx Server Dispatch mapping system with 100 positions, which was deployed in 2012. In 2019, the region received approximately 1.60 million 9-1-1 calls.

In addition, CAECD recently deployed GeoComm GIS Data Hub for automated GIS data QC and aggregation tasks.

### Customer Contact

Richard Morales, Director of Emergency Communications  
6800 Burleson Road  
Building 310 – Suite 165  
Austin, TX 78744  
Email: [rmorales@capcog.org](mailto:rmorales@capcog.org)  
Telephone: (512) 916-6044

## Tab F

## Proposal Pricing

The following pages include completed Exhibit A SHARE Retainer and Exhibit B Bid Item #2 NCT9-1-1.

### Exhibit B Bid Item #2 Pricing Summary

GeoComm is excited to offer NCT9-1-1 our new mapping system. We carefully considered the requirements in the RFP, our history of delivering 9-1-1 mapping capabilities to NCT9-1-1, the unique, robust GIS environment the NCT9-1-1 team manages, and the evolving nature of technology to develop this pricing. GeoComm considers the NCT9-1-1 team to be a valued collaborator.

In addition, we have proposed a purpose-built cloud-based 9-1-1 mapping system, that by itself, does not require the hardware and systems required to support GeoLynx Server. Cloud-based solutions offer a significant amount of benefits over on-premise deployment of technology. Cloud-based solutions provide ease of deployment, reduced IT infrastructure costs, fewer vulnerabilities, and newer technology, backed by AWS and GeoComm cybersecurity expertise.

### Cloud Benefits

The proposed cloud-hosted mapping solution includes the following highlights and offers the benefits to the region:

- Secure and reliable platform built to meet industry standards
- Simplified map data update process via secure web portal
- Reduced IT hardware and maintenance costs
- Easy to update the map data
- Application updates on a predictable schedule
- Fully integrated with GIS data management workflows

### Year One Recurring Costs Price Adjustment

As a valued Key Account, GeoComm proposes the first year of recurring costs to include a 50% Key Account Price Adjustment. As communicated throughout this proposal, GeoComm will provide continuous feature delivery during the first year of recurring services as well and plans to collaborate with NCT9-1-1 regarding the feature requirements and prioritization.

## Exhibit B Pricing Parameters

The pricing presented in Exhibit B is based on the following assumptions:

- Pricing is valid for 163 positions. Additional positions in the first year may be added for \$128 per month. Additional positions in years thereafter may be added for \$255 per month, per position
- Pricing considers NCT9-1-1's current subscription to GeoComm GIS Data Hub as the entry point for submitting data into GeoComm's GIS Data Hosting system and GeoComm mapping
- Pricing includes testing support with one CHE provider not to exceed \$10,000

## Optional Services Pricing

GeoComm is proposing that NCT9-1-1 host their aerial imagery and make it available as a service consumable by GeoComm's mapping system.

Alternatively, GeoComm could host NCT9-1-1's aerials as part of the GeoComm GIS Hosting service. The price to host up to 6 TBs of data, the estimated size of fully cached NCT9-1-1 aerials, is \$35,047 per year. Additional units of storage may be required and can be purchased for \$597 per year; per 10 GBs.

Pricing Format Request Example for Dispatch Mapping Services		Procurement No.:	NCT 2020-052
<b>Proposer Name:</b>	Geo-Comm, Inc.		
<b>Notes:</b>	1. <b>This pricing sheet is for Dispatch Mapping services only.</b> 2. Please provide hourly rates for all staff required for any function your firm provides for these services. 3. Use as many lines as needed. 4. Detail any additional information as necessary. 5. Proposers are encouraged to offer additional functions or services as a catalog option. Please provide any additional options your firm can provide with 'list less' or 'cost plus' percentages for pricing. A copy of any catalog services should be included with this response.		
<b>Exhibit A - Cost Proposal for SHARE</b>			
Item	Description	Offered Price	
2492	GIS Specialist I	\$103/hour	
2493	GIS Specialist II	\$140/hour	
2494	GIS Specialist III	\$160/hour	
2490	GIS Analyst	\$171/hour	
2222	GIS Manager	\$185/hour	
2254	GIS Project Manager	\$185/hour	
2224	Implementation Specialist	\$140/hour	
2491	Training Specialist	\$140/hour	
2496	Support Manager	\$185/hour	
2495	Implementation Manager	\$185/hour	
2461	GeoComm Dispatch Map Training Course (remote training)	\$739	
2466	GeoComm Dispatch Map Basic; Term Licensing and Support & Maintenance (per license) (first year due at contract signing; minimum 1 year-term contract) (annual price)	\$1,503	
2466	GeoComm Dispatch Map Basic; Term Licensing and Support & Maintenance (per license) (first year due at contract signing; minimum 3 year-term contract) (annual price)	\$1,361	
2467	GeoComm Dispatch Map Standard; Term Licensing and Support & Maintenance (per license) (first year due at contract signing; minimum 1 year-term contract) (annual price)	\$2,419	
2467	GeoComm Dispatch Map Standard; Term Licensing and Support & Maintenance (per license) (first year due at contract signing; minimum 3 year-term contract) (annual price)	\$2,104	
2478	GeoComm Dispatch Map CAD Interface; Viewing Only; Term Licensing and Support & Maintenance; one license per site, per CAD; (first year due at contract signing; minimum 3 year-term contract) (annual price)	\$2,252	
2485	GeoComm Dispatch Map AVL Interface; Viewing Only; term license; annual fee; (first year due at contract signing; minimum 3 year-term contract) (annual price)	\$2,252	
2474	GeoComm Maintainer GIS Data Manager Term Licensing; one license per workstation; annual fee; must contract for 3-year minimum	\$1,602	
2475	GeoComm Maintainer MSAG Manager Term Licensing; one license per workstation; annual fee; must contract for 3 year minimum	\$534	

2488-1	GIS Data Hub QC & Validation One Time Setup Fee (per agency; population 1-100,000)	\$1,235
2488-2	GIS Data Hub QC & Validation One Time Setup Fee (per agency; population 100,001-500,000)	\$1,852
2488-3	GIS Data Hub QC & Validation One Time Setup Fee (per agency; population 500,001-1,000,000)	\$3,396
2488-5	GIS Data Hub Aggregation One Time Setup Fee (per agency; population 1-100,000)	\$2,147
2488-6	GIS Data Hub Aggregation One Time Setup Fee (per agency; population 100,001-500,000)	\$3,222
2488-7	GIS Data Hub Aggregation One Time Setup Fee (per agency; population 500,001-1,000,000)	\$5,907
2422-1	GeoComm GIS Data Hub QC & Validation Annual Fee (per agency; population 1-100,000)	\$3,284
2422-2	GeoComm GIS Data Hub QC & Validation Annual Fee (per agency; population 100,001-500,000)	\$6,569
2422-3	GeoComm GIS Data Hub QC & Validation Annual Fee (per agency; population 500,001-1,000,000)	\$14,779
2422-5	GeoComm GIS Data Hub Aggregation Annual Fee (per agency; population 1-100,000)	\$5,712
2422-6	GeoComm GIS Data Hub Aggregation Annual Fee (per agency; population 100,001-500,000)	\$11,424
2422-7	GeoComm GIS Data Hub Aggregation Annual Fee (per agency; population 500,001-1,000,000)	\$25,703
1073	GeoLynx Mobile MDC Edition (1 license; perpetual licensing)	\$490
2199	GeoLynx Mobile MDC Edition (1 license; perpetual licensing) Annual Software Support and Maintenance	\$99
469	GeoComm ECRF One Time Setup Fee (includes one (1) web-based training session)	\$79,942
2313	GeoComm ECRF Annual Base Fee (term licensing)	\$116,795
771-1	GeoComm ECRF Annual Fee (per agency; population 0-50,000; term licensing)	\$5,095
771-2	GeoComm ECRF Annual Fee (per agency; population 50,001-100,000; term licensing)	\$11,119
771-3	GeoComm ECRF Annual Fee (per agency; population 100,001-250,000; term licensing)	\$22,127
771-4	GeoComm ECRF Annual Fee (per agency; population 250,001-500,000; term licensing)	\$39,838
771-5	GeoComm ECRF Annual Fee (per agency; population 500,001-750,000; term licensing)	\$61,492
771-6	GeoComm ECRF Annual Fee (per agency; population 750,001-1,000,000; term licensing)	\$82,861
771-7	GeoComm LVF One Time Setup Fee (includes one (1) web-based training session)	\$27,979
2314	GeoComm LVF Annual Base Fee (per deployment; term licensing)	\$40,878
2348-1	GeoComm LVF Annual Fee (per agency; population 0-50,000; term licensing)	\$828
2348-2	GeoComm LVF Annual Fee (per agency; population 50,001-100,000; term licensing)	\$1,987

2348-3	GeoComm LVF Annual Fee (per agency; population 100,001-250,000; term licensing)	\$4,885
2348-4	GeoComm LVF Annual Fee (per agency; population 250,001-500,000: term licensing)	\$10,129
2348-5	GeoComm LVF Annual Fee (per agency; population 500,001-750,000; term licensing)	\$14,848
2348-6	GeoComm LVF Annual Fee (per agency; population 750,001-1,000,000; term licensing)	\$20,424
2524	GeoComm Resolver One Time Fee (Included with GIS Data Hub)	Included
2524	GeoComm Resolver Annual Fee (Included with GIS Data Hub)	Included
2348-7	GeoComm Submitter Annual Fee (1 license, term license)	\$395
2523	GeoComm SI One Time Fee (per agency; population 0-50,000; includes remote training)	\$1,490
2526-1	GeoComm SI One Time Fee (per agency; population 50,001-100,000; includes remote training)	\$1,986
2526-2	GeoComm SI One Time Fee (per agency; population 100,001-250,000; includes remote training)	\$2,483
2526-3	GeoComm SI One Time Fee (per agency; population 250,001-500,000: includes remote training)	\$2,980
2526-4	GeoComm SI One Time Fee (per agency; population 500,001-750,000; includes remote training)	\$4,471
2526-5	GeoComm SI One Time Fee (per agency; population 750,001-1,000,000; includes remote training)	\$5,464
2526-6	GeoComm SI Annual Fee (per agency; population 0-50,000; term licensing)	\$2,700
2525-1	GeoComm SI Annual Fee (per agency; population 50,001-100,000; term licensing)	\$5,412
2525-2	GeoComm SI Annual Fee (per agency; population 100,001-250,000; term licensing)	\$8,113
2525-3	GeoComm SI Annual Fee (per agency; population 250,001-500,000: term licensing)	\$10,826
2525-4	GeoComm SI Annual Fee (per agency; population 500,001-750,000; term licensing)	\$18,938
2525-4	GeoComm SI Annual Fee (per agency; population 750,001-1,000,000; term licensing)	\$24,350
	Perpetual Software not anticipated by this RFP; list less	11%
	Term licensing, Subscription licensing, and Professional Services, not anticipated by this RFP; list less	1%
	Training Services not anticipated by this RFP; list less	3%

## INSTRUCTIONS

### General

Only shaded boxes are editable.

Most tabs contain cells for Non-Recurring Costs (NRC) and Monthly Recurring Charges (MRC).

"Responder Input" rows are only to be used if the pricing element cannot be included in one of the required rows.

Save final document in the following format **Responder Name Attachment B - Pricing Proposal**

Print the workbook (not just the worksheets) to verify content.

Include the saved file when submitting the RFP response package to North Texas SHARE.

### Summary

Enter Respondent name and date in the designated cells.

All other cells are locked.

### Software as a Service (SaaS)

Change the freeform "Respondant Input" label as needed and enter the pricing information.

Use a separate sheet for each offering (e.g. SaaS, Owned and Operated, etc.)

The MRC amount are automatically multiplied by 12 when moved to the Summary tab.

### Owned and Operated (O&O)

Change the freeform "Respondant Input" label as needed and enter the pricing information.

The MRC amount are automatically multiplied by 12 when moved to the Summary tab.

### Other

Change the freeform "Respondant Input" label as needed and enter the pricing information.

The MRC amount are automatically multiplied by 12 when moved to the Summary tab.

### Fee and Charges Defined

Application Fee: The price charged for the application(s) contained in the proposed solution.

License Fees: the price charged for licenses or port fees that are contained in the proposed solution, but are not specifically bundled with the solution application. NCT9-1-1 desires to see unbundled pricing wherever feasible.

Hardware/non-customer provided: Any hardware provided as part of the proposed solution that is not provided by NCT9-1-1. Note that any license or port fees that must be applied to NCT9-1-1 owned hardware must be identified and must be listed and priced separately.

Implementation: Any cost or fee associated with implementation that is not captured under Application, License, or non-customer provided costs or fees.



<b>Respondent Name:</b>	Geo-Comm, Inc. (GeoComm)
<b>Date (MM/DD/YYYY):</b>	3/30/2020

	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5	
	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>
Software as a Service (SaaS)	\$ 148,399.00	\$ 249,384.00	\$ -	\$ 498,756.00	\$ -	\$ 498,756.00	\$ -	\$ 498,756.00	\$ -	\$ 498,756.00
Owned and Operated (O&O)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Other	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

<sup>1</sup> Monthly recurring charges from other tabs have been annualized on this Summary Tab

**Software as a Service (SaaS)**

Year 1	\$ 397,783.00
Year 1 + Year 2	\$ 896,539.00
Year 1 + Year 2 + Year 3	\$ 1,395,295.00
Year 1 + Year 2 + Year 3 + Year 4	\$ 1,894,051.00
Year 1 + Year 2 + Year 3 + Year 4 + Year 5 (Project Total)	\$ 2,392,807.00

**Owned and Operated (O&O)**

Year 1	\$ -
Year 1 + Year 2	\$ -
Year 1 + Year 2 + Year 3	\$ -
Year 1 + Year 2 + Year 3 + Year 4	\$ -
Year 1 + Year 2 + Year 3 + Year 4 + Year 5 (Project Total)	\$ -

<b>Respondent Name:</b>	Geo-Comm, Inc. (GeoComm)
<b>Date (MM/DD/YYYY):</b>	3/30/2020

Owned and Operated (O&O)	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5	
	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>
Application Fee										
License Fee										
Hardware/ Non-Customer Provided										
Implementation										
Additional Application Programming Interface (API) fees (if applicable)										
Additional data connection by data source type incremental fee (beyond initial data source connections)										
Service and Support Fee										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
<b>O&amp;O Total</b>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

<sup>1</sup> Enter monthly recurring charges (annualized MRC will appear on Summary Tab)

<b>Respondent Name:</b>	Geo-Comm, Inc. (GeoComm)
<b>Date (MM/DD/YYYY):</b>	3/30/2020

Software as a Service (SaaS)	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5	
	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>	NRC	MRC <sup>1</sup>
Application Fee	Included in License Fee									
License Fee	Not applicable	\$20,782.00		\$41,563.00		\$41,563.00		\$41,563.00		\$41,563.00
Hardware/ Non-Customer Provided	Not applicable									
Implementation	\$148,399									
Additional Application Programming Interface (API) fees (if applicable)	Not applicable									
Additional data connection by data source type incremental fee (beyond initial data source connections)	Not applicable									
Service and Support Fee	Included in License Fee									
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
Respondent Input										
<b>SaaS Total</b>	\$ 148,399.00	\$ 20,782.00	\$ -	\$ 41,563.00	\$ -	\$ 41,563.00	\$ -	\$ 41,563.00	\$ -	\$ 41,563.00

<sup>1</sup> Enter monthly recurring charges (annualized MRC will appear on Summary Tab)



## Tab G

## Required Attachments

The following pages include complete RFP attachments, including:

- ATTACHMENT I: Instructions for Proposals Compliance and Submittal
- ATTACHMENT II: Certifications of Offeror
- ATTACHMENT III: Certification Regarding Debarment, Suspension, And Other Responsibility Matters
- ATTACHMENT IV: Certification Regarding Lobbying
- ATTACHMENT V: Drug-Free Workplace Certification
- ATTACHMENT VI: Certification Regarding Disclosure of Conflict of Interest  
*GeoComm does not have a conflict and will file the CIQ within the deadline if a conflict arises.*
- ATTACHMENT VII: Certification of Fair Business Practices
- ATTACHMENT VIII: Certification of Good Standing Texas Corporate Franchise Tax Certification
- ATTACHMENT IX: Historically Underutilized Businesses, Minority or Women-Owned or Disadvantaged Business Enterprises  
*Not applicable to GeoComm. A blank copy of the form as been included at the end of this section.*

**ATTACHMENT I:  
INSTRUCTIONS FOR PROPOSALS COMPLIANCE AND SUBMITTAL**

**Compliance with the Solicitation**

Submissions must be in strict compliance with this solicitation. Failure to comply with all provisions of the solicitation may result in disqualification.

**Acknowledgment of Insurance Requirements**

By signing its submission, Offeror acknowledges that it has read and understands the insurance requirements for the submission. Offeror also understands that the evidence of required insurance may be requested to be submitted within ten (10) working days following notification of its offer being accepted; otherwise, NCTCOG may rescind its acceptance of the Offeror's proposals. The insurance requirements are outlined in Section 6.

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hostin

Date: March 24, 2020

**ATTACHMENT II:  
CERTIFICATIONS OF OFFEROR**

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hoskin

Date: March 24, 2020

**ATTACHMENT III:  
CERTIFICATION REGARDING DEBARMENT, SUSPENSION AND OTHER RESPONSIBILITY MATTERS**

This certification is required by the Federal Regulations Implementing Executive Order 12549, Debarment and Suspension, 45 CFR Part 93, Government-wide Debarment and Suspension, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668, 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned certifies, to the best of his or her knowledge and belief, that both it and its principals:

1. Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any federal department or agency;
2. Have not within a three-year period preceding this contract been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or Local) transaction or contract under a public transaction, violation of federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification, or destruction of records, making false Proposals, or receiving stolen property;
3. Are not presently indicated for or otherwise criminally or civilly charged by a government entity with commission of any of the offense enumerated in Paragraph (2) of this certification; and,
4. Have not within a three-year period preceding this contract had one or more public transactions terminated for cause or default.

Where the prospective recipient of federal assistance funds is unable to certify to any of the qualifications in this certification, such prospective recipient shall attach an explanation to this certification form.

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hoskin

Date: March 24, 2020



**ATTACHMENT IV:  
CERTIFICATION REGARDING LOBBYING**

The undersigned certifies, to the best of his or her knowledge or belief, that:

1. No federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an officer or employee of a Member of Congress in connection with the awarding of any federal contract, the making of any federal loan, the entering into of any cooperative Contract, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant, loan, or cooperative contract; and
2. If any funds other than federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this federal contract, grant, loan, and or cooperative contract, the undersigned shall complete and submit Standard Form – LLL, “Disclosure Form to Report Lobbying”, in accordance with the instructions.
3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers and that all sub-recipients shall certify accordingly.

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hostin

Date: March 24, 2020

**ATTACHMENT V:  
DRUG-FREE WORKPLACE CERTIFICATION**

The Geo-Comm, Inc. (company name) will provide a Drug Free Work Place in compliance with the Drug Free Work Place Act of 1988. The unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited on the premises of the Geo-Comm, Inc. (company name) or any of its facilities. Any employee who violates this prohibition will be subject to disciplinary action up to and including termination. All employees, as a condition of employment, will comply with this policy.

**CERTIFICATION REGARDING DRUG-FREE WORKPLACE**

This certification is required by the Federal Regulations Implementing Sections 5151-5160 of the Drug-Free Workplace Act, 41 U.S.C. 701, for the Department of Agriculture (7 CFR Part 3017), Department of Labor (29 CFR Part 98), Department of Education (34 CFR Parts 85, 668 and 682), Department of Health and Human Services (45 CFR Part 76).

The undersigned subcontractor certifies it will provide a drug-free workplace by:

Publishing a policy Proposal notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the workplace and specifying the consequences of any such action by an employee;

Establishing an ongoing drug-free awareness program to inform employees of the dangers of drug abuse in the workplace, the subcontractor's policy of maintaining a drug-free workplace, the availability of counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed on employees for drug violations in the workplace;

Providing each employee with a copy of the subcontractor's policy Proposal;

Notifying the employees in the subcontractor's policy Proposal that as a condition of employment under this subcontract, employees shall abide by the terms of the policy Proposal and notifying the subcontractor in writing within five days after any conviction for a violation by the employee of a criminal drug abuse statute in the workplace;

Notifying the Board within ten (10) days of the subcontractor's receipt of a notice of a conviction of any employee; and,

Taking appropriate personnel action against an employee convicted of violating a criminal drug statute or requires such employee to participate in a drug abuse assistance or rehabilitation program.

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hoskin

Date: March 24, 2020

**ATTACHMENT VI:  
CERTIFICATION REGARDING DISCLOSURE OF CONFLICT OF INTEREST**

The undersigned certifies that, to the best of his or her knowledge or belief, that:

“No employee of the contractor, no member of the contractor’s governing board or body, and no person who exercises any functions or responsibilities in the review or approval of the undertaking or carrying out of this contract shall participate in any decision relating to this contract which affects his/her personal pecuniary interest.

Executives and employees of contractor shall be particularly aware of the varying degrees of influence that can be exerted by personal friends and associates and, in administering the contract, shall exercise due diligence to avoid situations which give rise to an assertion that favorable treatment is being granted to friends and associates. When it is in the public interest for the contractor to conduct business with a friend or associate of an executive or employee of the contractor, an elected official in the area or a member of the North Central Texas Council of Governments, a permanent record of the transaction shall be retained.

Any executive or employee of the contractor, an elected official in the area or a member of the NCTCOG, shall not solicit or accept money or any other consideration from a third person, for the performance of an act reimbursed in whole or part by contractor or Department. Supplies, tools, materials, equipment or services purchased with contract funds shall be used solely for purposes allowed under this contract. No member of the NCTCOG shall cast a vote on the provision of services by that member (or any organization which that member represents) or vote on any matter which would provide a direct or indirect financial benefit to the member or any business or organization which the member directly represents”.

No officer, employee or paid consultant of the contractor is a member of the NCTCOG.

No officer, manager or paid consultant of the contractor is married to a member of the NCTCOG.

No member of NCTCOG directly owns, controls or has interest in the contractor.

The contractor has disclosed any interest, fact, or circumstance that does or may present a potential conflict of interest.

No member of the NCTCOG receives compensation from the contractor for lobbying activities as defined in Chapter 305 of the Texas Government Code.

Should the contractor fail to abide by the foregoing covenants and affirmations regarding conflict of interest, the contractor shall not be entitled to the recovery of any costs or expenses incurred in relation to the contract and shall immediately refund to the North Central Texas Council of Governments any fees or expenses that may have been paid under this contract and shall further be liable for any other costs incurred or damages sustained by the NCTCOG as it relates to this contract.

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hoskin

Date: March 24, 2020

# CONFLICT OF INTEREST QUESTIONNAIRE

FORM CIQ

For vendor or other person doing business with local governmental entity

This questionnaire is being filed in accordance with chapter 176 of the Local Government Code by a person doing business with the governmental entity.

By law this questionnaire must be filed with the records administrator of the local government not later than the 7th business day after the date the person becomes aware of facts that require the statement to be filed. See Section 176.006, Local Government Code.

A person commits an offense if the person violates Section 176.006, Local Government Code. An offense under this section is a Class C misdemeanor.

## OFFICE USE ONLY

Date Received

1 Name of person doing business with local governmental entity.

2

Check this box if you are filing an update to a previously filed questionnaire.

(The law requires that you file an updated completed questionnaire with the appropriate filing authority not later than September 1 of the year for which an activity described in Section 176.006(a), Local Government Code, is pending and not later than the 7th business day after the date the originally filed questionnaire becomes incomplete or inaccurate.)

3

Describe each affiliation or business relationship with an employee or contractor of the local governmental entity who makes recommendations to a local government officer of the local governmental entity with respect to expenditure of money.

4

Describe each affiliation or business relationship with a person who is a local government officer and who appoints or employs a local government officer of the local governmental entity that is the subject of this questionnaire.

# CONFLICT OF INTEREST QUESTIONNAIRE

For vendor or other person doing business with local governmental entity

**FORM CIQ**

Page 2

**5** Name of local government officer with whom filer has affiliation or business relationship. (Complete this section only if the answer to A, B, or C is YES.)

This section, item 5 including subparts A, B, C & D, must be completed for each officer with whom the filer has affiliation or business relationship. Attach additional pages to this Form CIQ as necessary.

A. Is the local government officer named in this section receiving or likely to receive taxable income from the filer of the questionnaire?

Yes       No

B. Is the filer of the questionnaire receiving or likely to receive taxable income from or at the direction of the local government officer named in this section AND the taxable income is not from the local governmental entity?

Yes       No

C. Is the filer of this questionnaire affiliated with a corporation or other business entity that the local government officer serves as an officer or director, or holds an ownership of 10 percent or more?

Yes       No

D. Describe each affiliation or business relationship.

**6** Describe any other affiliation or business relationship that might cause a conflict of interest.

**7**  
GeoComm does not have a conflict and will file the CIQ within the deadline if a conflict arises.

\_\_\_\_\_  
Signature of person doing business with the governmental entity

\_\_\_\_\_  
Date

**ATTACHMENT VII:  
CERTIFICATION OF FAIR BUSINESS PRACTICES**

That the submitter has not been found guilty of unfair business practices in a judicial or state agency administrative proceeding during the preceding year. The submitter further affirms that no officer of the submitter has served as an officer of any company found guilty of unfair business practices in a judicial or state agency administrative during the preceding year.

Name of Organization/Contractor(s):

Geo-Comm, Inc.

Signature of Authorized Representative:

Heather Hoskin

Date: March 24, 2020

**ATTACHMENT VIII:  
CERTIFICATION OF GOOD STANDING  
TEXAS CORPORATE FRANCHISE TAX CERTIFICATION**

Pursuant to Article 2.45, Texas Business Corporation Act, state agencies may not contract with for profit corporations that are delinquent in making state franchise tax payments. The following certification that the corporation entering into this offer is current in its franchise taxes must be signed by the individual authorized on Form 2031, Corporate Board of Directors Resolution, to sign the contract for the corporation.

The undersigned authorized representative of the corporation making the offer herein certified that the following indicated Proposal is true and correct and that the undersigned understands that making a false Proposal is a material breach of contract and is grounds for contract cancellation.

Indicate the certification that applies to your corporation:

    X               The Corporation is a for-profit corporation and certifies that it is not delinquent in its franchise tax payments to the State of Texas.

                     The Corporation is a non-profit corporation or is otherwise not subject to payment of franchise taxes to the State of Texas.

- Type of Business (if not corporation):         Sole Proprietor
- Partnership
- Other

Pursuant to Article 2.45, Texas Business Corporation Act, the North Central Texas Council of Governments reserves the right to request information regarding state franchise tax payments.

Heather Hoskins, Vice President of Finance and Administration  
(Printed/Typed Name and Title of Authorized Representative)

Heather Hoskins  
Signature

Date: March 24, 2020

