

RESOLUTION NO. \_\_\_\_\_

A RESOLUTION AUTHORIZING THE MAYOR TO ENTER INTO AN INTERLOCAL AGREEMENT WITH HAMILTON COUNTY GOVERNMENT AND HAMILTON COUNTY 911 EMERGENCY COMMUNICATIONS DISTRICT RELATIVE TO THE HAMILTON COUNTY ADDRESS VERIFICATION PROJECT, AND AUTHORIZING THE CITY'S SHARE, IN THE AMOUNT OF THREE HUNDRED SEVEN THOUSAND EIGHT HUNDRED EIGHTY-FOUR AND 67/100 DOLLARS (\$307,884.67).

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BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CHATTANOOGA, it is hereby authorizing the Mayor to enter into an Interlocal Agreement with Hamilton County Government and Hamilton County 911 Emergency Communications District relative to the Hamilton County Address Verification Project, and authorizing the City's share, in the amount of \$307,884.67.

ADOPTED: \_\_\_\_\_, 2013.

/mms



## INTERLOCAL AGREEMENT

This Interlocal Agreement is entered into on \_\_\_\_\_, 2013, by and between the City of Chattanooga, Tennessee, a municipal corporation and political subdivision of the State of Tennessee ("City"), Hamilton County, Tennessee, a political subdivision of the State of Tennessee ("County") and Hamilton County 911 Emergency Communications District ("District").

- WHEREAS, in order to meet the requirements for Next Generation 9-1-1 (NG9-1-1) compliance by the Tennessee Emergency Communications Board (TECB) and the National Emergency Number Association (NENA) and to produce an accurate address database for the City and the County, and;
- WHEREAS, it will be beneficial to the citizens of the City and the County to have an accurate address layer for the various activities involved with serving the citizens of the City and the County, and;
- WHEREAS, Hamilton County has issued a Request for Proposal and the responders and responses have been evaluated by the City, the County and the District, and;
- WHEREAS, the proposal by GeoComm, Incorporated of St Cloud, Minnesota has been determined to present the best solution for this purpose, and;
- WHEREAS, the cost of this solution will be \$923,654.00, and;
- WHEREAS, the benefit of this activity will be for the City, the County and the District.

Now, therefore, for and in consideration of these premises and benefits the parties agree to the following:

1. Hamilton County will enter into an agreement with GeoComm, Inc. to perform the service and provide the deliverables as defined and described in the attached agreement.
2. Hamilton County Geographic Information Systems (HCGIS) will provide leadership for the management of this agreement.
3. The City, the County and the District will provide the staff to work with HCGIS to best complete the project as described in the agreement and to benefit from the deliverables provided in the agreement.
4. The City, the County and the District will share equally in the cost of this agreement.

IN WITNESS WHEREOF, the parties have caused their respective names to be affixed by their duly authorized officers on this \_\_\_\_ day of \_\_\_\_\_ 2013.

HAMILTON COUNTY, TENNESSEE

BY: \_\_\_\_\_  
Jim Coppinger, Hamilton County Mayor

CITY of CHATTANOOGA, TENNESSEE

BY: \_\_\_\_\_  
Andy Berke, City of Chattanooga Mayor

HAMILTON COUNTY 9-1-1 EMERGENCY COMMUNICATIONS DISTRICT

BY: \_\_\_\_\_  
Don Allen, Chairman of the Board

## **GIS Services and Address Field Verification Project Agreement**

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This Project Agreement is made by and between, **Hamilton County** organized under the laws of the state of Tennessee, and **Geo-Comm, Inc.** ("GeoComm") a Minnesota corporation with its principal offices at 601 West St. Germain Street, St. Cloud, MN, 56301.

In this agreement the party who is contracting to receive the professional services shall be referred to as "the Customer" and the party who will be providing the services shall be referred to as "GeoComm."

GeoComm has an established background in communications engineering, geographic information systems development, cartography, software development, and professional project management and is willing to provide those services to the Customer based on this background.

The Customer desires to have services provided by GeoComm. Therefore, the parties agree as follows:

### **Section 1 - Description of Service**

Beginning upon contract signing GeoComm will provide the following goods and services (collectively the Services): Refer to the itemized Exhibits herein and made part of this agreement:

- GIS Services
- Address Field Verification
- Project Management
- Maintenance Workflow Development & Training

**Incorporation of Additional Documents** – Included in this Contract by reference are the following documents:

- a. The Request for Proposal and/or Bid Specifications and its associated amendments
- b. The Contracting Party's Proposal/Bid Response documents and any amendments
- c. The Contract Document and its attachments

In the event of a discrepancy or ambiguity regarding the Contracting Party's duties, responsibilities, and performance under this Contract, these documents shall govern in order of precedence detailed above.

### **Section 2 - Payment**

The Customer will pay a fee to GeoComm of **\$923,654.00** for services as described in this agreement and provided under this agreement by GeoComm. The Customer agrees to pay GeoComm on the following schedule:

\$ 138,548.12	Invoiced net 45 upon contract signing
\$ 138,548.09	Invoiced net 45 upon completion of resource collection, review and analysis
\$ 138,548.09	Invoiced net 45 upon completion of field verification of address data
\$ 138,548.09	Invoiced net 45 upon completion of boundary, street centerline and address updates
\$ 138,548.09	Invoiced net 45 upon completion of quality control and final synchronization review
\$ 138,548.09	Invoiced net 45 upon project completion and standard operating procedure (SOP) development
\$ 92,365.43	10% Retainer to be paid upon completion of the project

### **Section 3 - Late Payment Fee**

All invoices issued under this contract shall be submitted to the Customer net 45 days. A 1.5% service charge shall be assessed to all invoices not paid within 45 calendar days from date of invoice.

### **Section 4 - Expense Reimbursement**

GeoComm shall pay all "out-of-pocket" expenses and shall not be entitled to reimbursement from the Customer except by mutual prior agreement.

### **Section 5 - Performance of Services**

GeoComm will work as many hours as is necessary to fulfill its obligations under this agreement.

### **Section 6 - Standards of Work**

GeoComm agrees that the performance of work described in this Agreement and pursuant to this Agreement shall be done in a professional manner and shall conform to employ the care and skill ordinarily used by members of GeoComm's profession. GeoComm warrants that all equipment and/or software provided under this Agreement shall be new and in good working condition. All packaging and packing shall be in accordance with good commercial practice.

### **Section 7 - Changes in the Work**

The Customer may, at any time by written order, make changes within the general scope of the work including but not limited to, revisions of, additions to, or subtractions from, portions of the work, or changes in method of shipment or packaging and place of delivery.

If any change order causes an increase or decrease in the cost of or time required for the performance of any part of the work under this Agreement, an adjustment based on the exhibits, shall be made in the Agreement price or delivery schedule, or both, and the Agreement shall be modified in writing accordingly.

## **Section 8 - Excusable Delays**

Neither GeoComm nor the Customer shall be responsible for delays or lack of performance resulting from acts beyond the reasonable control of the party or parties.

## **Section 9 - Taxes**

The Customer may be a taxing authority and/or may be excluded from paying Federal, State, or Local excises, sales, lease, gross income, service, rental, use, property, occupation, or similar taxes. If GeoComm is required to pay taxes of the Customer, the Customer shall pay to GeoComm the amount of such taxes no later than thirty (30) days after receipt of an invoice.

## **Section 10 - Limitation of Liability**

To the fullest extent permitted by applicable law, and notwithstanding any other provision of this Agreement, the total liability, in the aggregate, of GeoComm and GeoComm's officers, directors, partners, employees and sub-consultants, and any of them, to the Customer and anyone claiming by or through the Customer, for any and all claims, losses, costs or damages, including attorneys' fees and costs of any nature whatsoever or expenses resulting from or in any way related to this agreement, including the products and services delivered by GeoComm hereunder or the use thereof by Customer, shall not exceed the total compensation received by GeoComm in project fees under this Agreement. It is intended that this limitation apply to any and all liability or cause of action however alleged or arising, unless otherwise prohibited by applicable law.

## **Section 11 - Termination**

Either party, upon thirty (30) days written notice to the other party, may terminate this Agreement for violation of the material terms of this Agreement and failure to cure any deficiency within a reasonable time after notice thereof. In the event of termination for just cause by the Customer, GeoComm shall refund all amounts received to that point. In the event of termination for just cause by GeoComm, the Customer shall forfeit any funds paid and return any software and hardware received.

**TERMINATION DUE TO UNAVAILABILITY OF FUNDS:** Payment and performance obligations for succeeding fiscal periods shall be subject to the availability and appropriation of funds therefore. When funds are not appropriated or otherwise made available to support continuation of performance in a subsequent fiscal period, the contract shall be canceled. In the event of a cancellation pursuant to this paragraph, contractor will be reimbursed the resulting unamortized, reasonably incurred, nonrecurring costs. Contractor will not be reimbursed any costs amortized beyond the initial contract term.

## **Section 12 - Relationship of Parties**

The parties understand that GeoComm is an independent contractor and not an employee of the Customer. The Customer will not provide fringe benefits, including health insurance benefits, paid vacation, or any other employee benefit for the benefit of GeoComm as a function of this agreement.

### **Section 13 - Disclosure**

GeoComm is required to disclose any outside activities or interests, including ownership or participation in the development of prior inventions, that conflict or may conflict with the best interests of the Customer. Prompt disclosure is required under this paragraph if the activity or interest is related, directly or indirectly, to any activity that GeoComm may be involved with or on behalf of the Customer.

### **Section 14 - Employees**

GeoComm's employees and agents, if any, who perform services for the Customer under this Agreement shall also be bound by the provisions of this agreement.

### **Section 15 - Injuries**

GeoComm acknowledges its obligation to obtain appropriate insurance coverage for the benefit of GeoComm and its employees. GeoComm waives any rights to recover damages from the Customer for any injuries that GeoComm and/or its employees may sustain while performing services under this agreement and that are in any way a result of the negligence of GeoComm or its employees or agents.

### **Section 16 - Insurance**

GeoComm shall obtain liability insurance for both personal injury and property damage. Any policy obtained and maintained under this clause shall provide that it shall not be cancelled, materially changed, or not renewed without thirty days prior notice thereof to the Customer.

Minimum limits for GeoComm liability insurance shall be in the amount of \$1,000,000.00 for any number of claims arising out of a single occurrence under a single limit or combined limit or excess umbrella general liability insurance policy. GeoComm shall additionally obtain Worker's Compensation Insurance extending coverage to all its employees. A certificate of insurance will be provided upon contract signing.

### **Section 17 - Data Confidentiality**

GeoComm agrees to review, examine, inspect, or obtain Customer data only for the purposes described in this agreement and to at all times hold such information confidential. The obligation to protect the confidentiality of confidential information disclosed to the other party shall extend for a period of five (5) years following disclosure and shall survive early termination of this Agreement.

### **Section 18 - Records Retention and Availability**

GeoComm agrees that the Customer, the State Auditor, or any of their duly authorized representatives at any time during normal business hours and as often as they may reasonably deem necessary shall have access to and the right to examine, audit, excerpt, and transcribe any books, documents, papers, records, etc., which are pertinent to the accounting practices and procedures of GeoComm and involve transactions relating to this Agreement.

GeoComm agrees to maintain these records for a period of three (3) years from the date of termination of this Agreement.

## **Section 19 - Ownership**

It is agreed by and between the parties that all products created as a result of this contract will be the sole property of the Customer. With the exception of the GeoComm's proprietary software products, all products created and delivered under this agreement may be used, altered, and distributed at the Customer's discretion.

## **Section 20 - Nondiscrimination**

During the performance of this contract, GeoComm agrees as follows:

- a) GeoComm shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, national origin, age, disability, or other basis prohibited by state law relating to discrimination in employment, except where there is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor. GeoComm agrees to post in conspicuous places, available to employees and applicants for employment, notices setting the provisions of this nondiscrimination clause.
- b) GeoComm, in all solicitations or advertisements for employees placed by or on behalf of GeoComm, shall state that such contractor is an equal opportunity employer.
- c) Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.
- d) GeoComm shall include the provisions of the foregoing paragraphs of this section in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

## **Section 21 - Drug-Free Workplace to be maintained by the Contractor**

During the performance of this contract, GeoComm agrees as follows:

- a) GeoComm shall provide a drug-free workplace for all of their employees. GeoComm agrees to post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in the workplace and specify the actions that will be taken against employees for violations of this prohibition.
- b) GeoComm, in all solicitations or advertisements for employees placed by or on behalf of GeoComm, shall state that such contractor maintains a drug-free workplace.
- c) Notices, advertisements, and solicitations placed in accordance with federal law, rule, or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section.

GeoComm shall include the provisions of the foregoing paragraphs of this section in every subcontract or purchase order of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor.

## **Section 22 - Assignment**

GeoComm's obligations under this Agreement may not be assigned or transferred to any other person, firm, or corporation without the prior written consent of the Customer.

## **Section 23 - Notices**

All notices required or permitted under this agreement shall be in writing and shall be deemed delivered in person or deposited in the United States mail, postage prepaid, addressed as follows. Either party may change such address from time to time by providing written notice to the other in the manner set forth above.

### **Hamilton County**

Linda Chumbler  
RFP Coordinator  
Hamilton County Purchasing Department  
455 N. Highland Park Avenue  
Chattanooga, TN 37404  
E-mail [lindac@hamiltontn.gov](mailto:lindac@hamiltontn.gov)

### **GeoComm**

Greg Murdock  
Assistant GIS Services Manager  
601 West St. Germain Street  
St. Cloud, MN 56301  
Phone (320) 240-0040  
E-mail [gmurdock@geo-comm.com](mailto:gmurdock@geo-comm.com)

## **Section 24 - Amendment**

This Agreement may not be modified or amended unless the amendment is made in writing and is signed by both parties.

## **Section 25 - Severability**

If any provision of this Agreement shall be held to be invalid or unenforceable for any reason, the remaining provisions shall continue to be valid and enforceable. If a court finds that any provision of this agreement is invalid or unenforceable, but that by limiting such provision it becomes valid and enforceable, then such provision shall be deemed to be written, construed, and enforced as so limited.

## **Section 26 - Waiver of Contractual Right**

The failure of either party to enforce any provision of this Agreement shall not be construed as a waiver or limitation of that party's right to subsequently enforce and compel strict compliance with every provision of this Agreement.

**Section 27 - Laws to be Observed**

GeoComm shall keep fully informed of all Federal and state laws, all regulations pertaining to the Occupational and Safety Hazards Act (OSHA), all local laws, ordinances and regulations, and all orders and decrees of bodies and tribunals having any jurisdiction or authority, which in any manner affect the conduct of work.

**Section 28 - Applicable Law**

If there is any dispute concerning this agreement, the laws of the state of Tennessee shall apply. Proper venue and jurisdiction for all lawsuits, claims, disputes, and other matters in questions between the parties to this agreement or any breach thereof shall be in the state of Tennessee.

By:

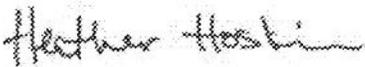
\_\_\_\_\_  
Signature/Title

Date:

\_\_\_\_\_

**For Geo-Comm, Inc.**

By:

  
\_\_\_\_\_  
Heather Hoskins/Controller

Date:

9-27-13  
\_\_\_\_\_

**XIII. PROPOSAL PRICING**

**A. Project Delivery**

Vendors are responsible for the timely acquisition, development, customization and delivery of all professional services and data listed in this document. Proposals must contain a complete description of services included in your bid response as well as an estimated timeline for delivery as defined in the RFP details.

Any non-vendor supplied equipment or services required to complete the project must be specifically noted as previously specified including any required supporting documentation. All proposed services must be included in writing with the bid.

**GeoComm understands and complies.**

**B. Pricing**

Please include a detailed, itemized price for your proposed GIS services and address field verification, separating components as appropriate. Include a detailed line item description including unit pricing where necessary and applicable. Any proposed professional services should also be itemized in detail and priced separately. Any training costs should be detailed separately. Hourly rates must be specified as well as the number of hours required.

**Pricing Detail**

Description	Hours	Hourly Rate	Hourly Cost	Expenses	Total Price
On-site Kickoff (GIS Consultant)	56	\$118.75	\$6,650	\$1,660	\$8,310
On-site Kickoff (GIS PM)	46	\$118.75	\$5,463	\$1,005	\$6,468
On-site Kickoff (GIS Supervisor)	34	\$90.25	\$3,069	\$960	\$4,029
Resource Collection Review and Analysis	30	\$66.50	\$1,995		\$1,995
Fieldwork Prep	257	\$66.50	\$17,091	\$2,243	\$19,334
On-site Fieldwork	6548	\$90.25	\$590,957	\$143,004	\$733,961
Fieldwork Processing	560	\$66.50	\$37,240		\$37,240
NG9-1-1 GIS Data Updates	323	\$66.50	\$21,480		\$21,480
Quality Control and Final Synchronization	77	\$66.50	\$5,121		\$5,121
Supervisory	307	\$90.25	\$27,707		\$27,707
Project Management	379	\$118.75	\$45,006		\$45,006
Maintenance Workflow Development	68	\$118.75	\$8,075		\$8,075
Maintenance Workflow Training	30	\$118.75	\$3,563	\$1,365	\$4,928
<b>Total:</b>					<b>\$923,654</b>
<p><b>Notes:</b> Price is calculated based on the designated project team, estimated hours to complete the scope of work, administrative services, and direct reimbursable expenses such as airfare, travel expenses, and print and postage fees. Hamilton County is responsible for payment of all applicable sales tax.</p>					

On-site Fieldwork pricing includes one pass throughout the county to field-verify the address point layer. Additional passes, if needed, will be priced out separately.

Public Awareness is included in the cost of fieldwork prep

During the project, any additional services requested by Hamilton County not identified in the scope of work will be negotiated and an amendment will be issued to the original contract. If Hamilton County prefers, additional services will be billed at our hourly rate plus any fees for travel and expenses.

**C. Terms**

The payment terms must be clearly stated in the bid specifications. Payment terms should be structured using a milestone based payment schedule. The schedule should start with contract signing, following a logical progression of system delivery and installation, then conclude with the final system acceptance.

GeoComm's payment terms represent equitable payment based on GeoComm's incurrence of expenses and completion of work. GeoComm payments will be based on predetermined project milestones with the final payment due upon project completion and presentation of the final deliverables. GeoComm's standard payment terms are net 45 from the invoice date. A payment schedule will be negotiated with the county during contract negotiations.

**XII. PROFESSIONAL SERVICES AND SUPPORT**

**A. Project Management**

Please provide a detailed description of your approach to project management for this project, included your full proposal and timeline.

GeoComm provides a methodical project management approach based on Project Management Institute (PMI) standard practices. The following techniques will be used throughout the project to keep costs low and to meet project deadlines:

- Development of a Project Team
- Project Kickoff Meetings
- Regular Conference Calls and Status Reports
- Project Management Web Portal
- Continuous Review of Work in Progress
- Project Plan Development

Development of a Project Team

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GeoComm will develop a project team consisting of a highly qualified project manager who is supported by public safety GIS specialists and GIS consulting experts. This team uses expertise and talents of individuals from the GIS division, each specializing in different aspects of the project. GeoComm team members will be assigned specific duties related to the technical and administrative elements of the project. The project manager will provide the guidance necessary for all elements of the project to be implemented correctly and in a timely manner.

Project Kickoff Meetings

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One of the first steps in GeoComm's project management plan is to make certain the project team has an in-depth understanding of Hamilton County's project goals. During an initial internal meeting, project management staff will provide the team with information regarding any nuances in the scope of work, schedule, and their individual responsibilities for the project.

Following the internal project team meeting, GeoComm will schedule an on-site project initiation meeting with the Hamilton County project team. Key personnel from GeoComm, including the primary project manager and supporting management staff, will attend this meeting in person with additional project team members participating via teleconference.

The following items will be discussed at the project initiation meeting:

- Introductions: participating stakeholders and GeoComm staff
- Review of project objectives and goals
- Defining customer expectations

- Establishing communication processes
- Reviewing project timeline
- Initial GIS data schema
- Existing resources that may be used in developing the GIS data layers
- Developing a plan for public awareness of the project

Through open communication between Hamilton County and the GeoComm project team an understanding of the depth of the project scope will be gained. This open communication will be ongoing throughout the entire project and has proven to be an essential part of successful project implementation.

#### Regular Conference Calls and Status Reports

Project status is discussed internally at GeoComm on a regular basis. The project manager holds weekly status meetings with the GIS Supervisor overseeing daily GIS data development to discuss project progress and identify any concerns. This proactive, hands-on approach allows the project manager to be involved in day-to-day activities and to identify and mitigate potential project road blocks.

GeoComm will hold regularly scheduled conference calls with Hamilton County to keep all parties informed of the project status. The team will set milestones at the beginning of the project that will be used to assess overall project progress. GeoComm and Hamilton County will review the overall schedule and determine the frequency of regular conference calls.

GeoComm's GIS professionals will also provide Hamilton County with formal monthly status reports outlining the following:

- Fieldwork completed including maps
- Products and digital files delivered
- Meetings held, planned, or needed
- Issues encountered or anticipated
- Production goals for next reporting period
- Schedule review

#### Project Management Web Portal

GeoComm will configure and host a password-protected Web portal, accessed via the Internet, to serve as a data gateway and project management tool. The Web portal will include:

- support and maintenance issue tracking
- a documentation library
- schedules
- the ability to upload and download data files
- tracking data delivery status
- project status reports

The web portal includes role-based user management so that administrators can control information accessible to individual users and/or groups of users.

## Continuous Review of Work in Progress

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GeoComm tracks all projects using Microsoft Dynamics Great Plains software. This software allows us to forecast, review, and evaluate where the project is at and where it will be in the near future. For the duration of the project, GeoComm monitors the actual status of the project in relation to expended hours to fully ensure the project needs are being met.

## Project Plan Development

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GeoComm will work with Hamilton County to formalize a well-defined project plan which can be used to guide the project towards successful completion. Initial steps of project planning have occurred as part of the proposal development process. Supplemental planning will occur during scope validation and project initiation meetings. The final project plan will be laid out in a document submitted to Hamilton County within two weeks following the onsite project kickoff meeting.

The project plan will detail the following topics:

- Project Assumptions and Constraints
- Deliverables Acceptance Practices
- Scope of Work Definition
- Public Awareness Plan
- Communications Management Plan
- Change Request Procedure
- GIS Data Development plan including
  - Data Inventory
  - GIS Data Development Methodology
  - Discrepancy and Addressing Issue Examples
  - Description of GIS Data Standards
- Project schedule with milestone projections for each task

The final project plan will be submitted to Hamilton County for review and approval prior to initiating data verification and development tasks. The approved plan is a working document to be maintained throughout the life cycle of the project and shall be amended as needed.

### **B. Project Tasks**

Responding vendors must have the available technical expertise, either directly employed or contracted, to plan, configure and implement the proposed solution. These services must be included in the RFP response and be clearly denoted. The list of proposed professional services in Section I.C should be used as a reference to formulate an RFP response. Please address each of the specific tasks as described in Section I.C with a thorough description of your approach and/ or proposed plan on each.

Include a detailed description, with samples and timeline, of the public awareness and education campaign you propose to inform businesses and residents about the project.

To meet the project goals outlined in section 1.C of the RFP, GeoComm will complete the following project tasks for Hamilton County:

- Task One – Public Awareness
- Task Two – Resource Collection, Review, and Analysis
- Task Three – Field Verification of Address Data
- Task Four – Boundary Layer Updates
- Task Five – Street Centerline Layer Updates
- Task Six – Address Point Layer Updates
- Task Seven – Quality Control and Synchronization
- Task Eight - Standard Operating Procedure (SOP) Development

### Task One: Public Awareness

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Public awareness and education are essential to the success of public safety GIS and countywide addressing field verification projects. GeoComm has experienced a substantial increase in cooperation and response when the public is well informed about the project. We employ a comprehensive approach to public awareness which includes:

1. Designating a *dedicated staff member* to the public awareness effort
2. Ensuring the designated staff member *does all the necessary "heavy lifting"*
3. Continuation of public awareness throughout the *entire project*

GeoComm's Project Coordinator will be the dedicated public relations staff member who will develop and coordinate the project's public awareness efforts. The project coordinator will work with designated Hamilton County staff to drive the public awareness efforts, doing the heavy lifting on the County's behalf. At a minimum, their responsibilities will include:

- Drafting and managing the distribution of press releases as needed
- Providing updated project status via the web and social media
- Designing and coordinating the distribution of informational flyers/brochures
- Coordination with local Law Enforcement
- Assisting with other public awareness activities as needed

Public awareness options will be discussed in depth during project kick-off and a public awareness plan will be documented as part of GeoComm's formal project plan. The public awareness campaign will commence after project kickoff and will continue seamlessly with GeoComm's lead throughout the entire project, from start to finish.

The pages that follow include more information about GeoComm's public awareness tools.

#### Press Releases

At various stages of the project, GeoComm will draft press releases for distribution to local media outlets. The purpose of the press release is to:

- communicate the purpose and importance of the project,
- describe how local cooperation will help in its successful completion,
- summarize project status, and
- detail GeoComm's activities in specific locations of the county

It is anticipated that an introductory press release will be distributed at the beginning of the project, with additional press releases following to report on status and current fieldwork locations. GeoComm will work with county officials to determine the general logistics including specific wording, specific avenues for distribution, who should be notified, and how frequently press releases should be distributed.

#### Web Updates

GeoComm will work with Hamilton County to develop a private landing page on our main web-site ([www.geo-comm.com](http://www.geo-comm.com)) or alternatively, provide content for a Hamilton County webpage. The purpose of this site is to boost public awareness for the project and allow residents, businesses, and county officials to easily view and track project status. The site will include a description of the project, project goals, data collection status information, and a calendar with projected fieldwork dates for various areas of the county. Links to this website can be included on other public awareness documents including press releases and flyers.

The website will be updated monthly to correspond with the distribution of monthly status reports, and as needed when major project milestones are reached.

Another increasingly popular way to communicate project status is through social media. If Hamilton County has a Facebook page or Twitter handle, GeoComm can provide brief status updates on a regularly scheduled basis. If needed, new Facebook or Twitter accounts specific to Hamilton County Address Verification Project can also be set up and managed by GeoComm.

#### Informational Flyers/Brochures

GeoComm has found that informational flyers are an easy and effective way to reach a large group of local residents. Displaying information about the project in public places will help residents and businesses become more familiar with GeoComm's efforts and in turn can boost their level of cooperation. Flyers containing information about the project can be posted at various public places throughout the county including:

- Grocery Stores
- Church/Place of Worship
- Restaurants/Local Dinners/VFW/American Legions
- Schools
- Post Offices
- Shopping Centers
- Senior Citizen Centers
- Golf Course Clubhouse/Gun Clubs

GeoComm will work with Hamilton County to design a flyer and then coordinate with Field Specialists to post them at county-approved locations.

If needed, GeoComm can also reach out to local organizations to assist with distributing flyers. Other avenues that have proven successful in past projects include:

- Service Organizations such as Girl/Boy Scouts, Lions Club, Jaycees, Other Volunteers handing out flyers at special events
- Health Care/Gas/Power/Electrical Companies inserting flyers into monthly billing statements

#### Coordination with Local Law Enforcement

During fieldwork, GeoComm will report the locations of our Field Specialists to the local PSAP and Law Enforcement agencies. Proactively reporting field activity is not only an added safety benefit for our field crews, but also reduces the amount of confusion and concern if residents call in to report GeoComm activity.

#### Other Public Awareness Activities

GeoComm believes a multi-faceted public awareness approach yields the most effective results. In addition to the public awareness outlets mentioned previously, we welcome input from Hamilton County on other methods for notifying the public about the project.

### Task Two: Resource Collection, Review, and Analysis

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#### Resource Collection

The GeoComm project team will work with Hamilton County to identify GIS data development resources that may be used for this project. GeoComm anticipates the following minimum resources will be made available:

- Hamilton County MSAG
- Hamilton County ALI database
- Existing GIS Data layers
  - Street centerlines
  - Emergency Service Zone boundaries
  - Postal boundaries
  - Municipal boundaries
  - Parcels with premise addresses
  - Building footprints
- 2012 High Resolution Aerial Imagery
- Zip +4 database available from Tennessee Office of Information Resources (OIR)

Other resources that are not necessarily required but that may be helpful include:

- Postal databases
- Utility listings
- Other address databases

GeoComm's project management Web portal will be available for uploading project resources. Resources must be provided by Hamilton County within an agreed upon

timeframe following the project initiation meeting. GeoComm will track receipt of project resources on the project management Web portal.

### Resource Review

GeoComm recognizes the importance of gaining a solid understanding of available project resources. After acquiring all needed resources, GeoComm will review them and determine how they can best be utilized during the GIS data development phases. This includes working with Hamilton County to determine a hierarchy of resource priority. The confidence level for each resource will be assessed and ranked by GeoComm based on:

- Accuracy
- Completeness
- Relevance of data or age of data
- Original development process
- Maintenance of the database

### Resource Analysis

GeoComm will complete a preliminary analysis of the existing GIS map data layers provided by Hamilton County to identify omissions or inaccuracies in the data. Completing this analysis prior to field verification is beneficial because, if need be, certain issues can be flagged for investigation in the field. This proactive field verification approach goes beyond mere observation of address data, providing a deeper, more thorough level of address validation.

The pre-fieldwork analysis will include a comprehensive review of the provided street centerline and address point layers as outlined below.

Street Centerlines	Address Points
The street centerline layer will be reviewed to: <ul style="list-style-type: none"><li>• identify inaccuracies, incompleteness, and inconsistencies in street centerline name</li><li>• identify inaccuracies, incompleteness, and inconsistencies in address range attributes</li></ul>	The address point layer will be reviewed to verify: <ul style="list-style-type: none"><li>• the location of duplicate address points</li><li>• the consistency of address information</li><li>• address point features without an address</li><li>• odd/even parity issues (e.g. odd addresses located on the even side of the road)</li></ul>

A visual scan of the existing street centerline and address point layers will also be completed alongside provided aerial imagery. This allows GIS Specialists to identify potential missing roads, address points, or other special fieldwork situations. It also helps our staff become better acquainted with the county and in turn, to complete field verification more efficiently.

In addition to identifying discrepancies in the GIS data, GeoComm's pre-fieldwork analysis also assesses synchronization levels between the GIS map data, MSAG, and ALI database. With higher synchronization rates between these three components, comes a greater probability for accurately pin-pointing emergency call locations in your E9-1-1 system. In addition, for NG9-1-1 systems, accuracy and synchronization will be crucial for call routing, call handling, call delivery, location validation, and emergency response. To comply with

the State of Tennessee's NG9-1-1 GIS Data requirements, Hamilton County's GIS Data layers must be at least 98 percent synchronized with the MSAG and ALI database.

GeoComm will perform two automated procedures to identify synchronization issues between the GIS data, MSAG, and ALI database. The results will highlight ALI database records that are not found in the GIS data as well as addressing information in the GIS data that is not MSAG-valid.

First, GeoComm will compare attributes in the address point and street centerline layers against the MSAG. These procedures will verify that street names are spelled consistently, that house numbers and address ranges fit the ranges of the MSAG, and ESN and community attributes are in synch. GIS data that does not match the MSAG for any of these reasons will be identified.

Second, GeoComm will compare house number and street name values in the ALI database against the address point and street centerline layers. Road name inconsistencies, incorrect address ranges, and missing address points or road segments will be identified. The process also compares ESN and community information to confirm whether ALI database addresses locate within the appropriate boundaries in the GIS map data. Comparing the specific records in the ALI database will generate a list of addresses that do not match the GIS map data, along with detailed result codes explaining the specific discrepancy.

After the pre-fieldwork analysis is complete, results will be compiled into a hard copy report and digital lists of the errors will be developed. This information will be used by GeoComm as the foundation for updates completed in Tasks Three, Four, Five, and Six. The report will also be provided to Hamilton County to serve as snapshot of the GIS data prior to GeoComm's updates. As discussed in Task Seven, a similar analysis will be performed at project completion to ensure GeoComm's work has sufficiently met the county's objectives.

Prior to fieldwork, GeoComm will work through the issues identified and will correct obvious errors within the street centerline and address point layers. Remaining errors will then be flagged for review in the field.

### Task Three: Field Verification

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GeoComm field verification will be broken down into three specific subtasks:

- Fieldwork Prep
- On-site Fieldwork
- Fieldwork Processing

#### Fieldwork Prep

Prior to on-site fieldwork, multiple efficiency-based tasks will be completed to reduce the amount of time in the field and ensure data completeness and accuracy. These tasks include:

- Coordinating fieldwork plan with county contacts and scheduling onsite meetings

- Designing and preparing leave-behind surveys
- Developing a fieldwork zone layer
- Equipment set up and testing

#### Coordinate Fieldwork Plan

The project plan developed at the onset of the project will detail GeoComm's estimated field verification/collection schedule broken up by fieldwork zone and approximate completion date. GeoComm will review the overall fieldwork plan with the county to identify any special considerations or potential areas of concern where law enforcement escort is advisable.

In addition, a meeting will be scheduled between Hamilton County contacts and the GeoComm field crew upon their arrival onsite. The purpose of this meeting is to introduce the GIS Field Specialists to key Hamilton County staff members, allowing the team to become acquainted. From time-to-time throughout fieldwork, it is possible that local residents may mistake field verification as suspicious activity. In the event that a resident calls the county to report such activity, it is important for local stakeholders to be familiar with GeoComm's field crew and the vehicles they are using.

#### Design and Prepare Leave-Behind Surveys

If a face to face survey is necessary to collect information during fieldwork, but no one is available, GIS Specialists will leave a tri-fold informational pamphlet behind that will include:

- information concerning the project
- a link to an online address verification survey to be completed by the resident or business
- a toll-free phone number for residents to call if they have questions or concerns or are unable to verify their address via the online survey

Each survey is uniquely tied to a corresponding address point based on a static unique id number, for easy cross-reference back to the GIS data.

The informational flyer and digital online survey (or survey can be done via telephone (800) number provided) will be designed by GeoComm and will be provided to Hamilton County for approval. Once approved, GeoComm will print the pamphlets and insert them into weatherproof doorknob bags that can easily be left behind in the field.

#### Fieldwork Zones Layer Development

To maximize field verification efficiency, GeoComm will develop a GIS polygon layer to divide the county into various fieldwork regions. Members of GeoComm's field verification team will be assigned specific regions throughout the fieldwork process, which improves organization and prevents duplication of field verification efforts.

A fieldwork zones layer can also assist with strategic planning for overnight accommodations as GeoComm's field crew may stay in different hotels based on which zone they are located in. This reduces the amount of driving required to reach each target area, making better use of fuel resources and field verification time.

#### Equipment Set up and Testing

GeoComm's GIS staff utilizes Trimble professional grade GeoXH handheld GPS units for field data collection. These GPS units are highly accurate, producing sub-meter horizontal accuracy in real-time and sub-foot horizontal accuracy after post-processing.

In conjunction with the Trimble GeoXH unit, GIS Specialists also utilize laptops equipped with Esri's ArcGIS for Desktop software. This combination provides optimal display of GIS data in the field and allows verification to be conducted more efficiently.

After acquiring existing GIS map data and aerial photography from Hamilton County, GeoComm will design an ArcMap map document (.mxd) which stores the map layers used for reference during field verification. Map layer symbology will be set so that field workers can easily distinguish road classifications, fieldwork zones, and boundaries for cities, parks, etc. To easily track fieldwork progress, address points will be symbolized with different colors based on whether they have been verified or not yet visited.

In addition to designing the map display, GeoComm will set up Geodatabase domains for the address point layer. Domains increase productivity during data collection by allowing Field Specialists to choose from drop down pick lists of predefined attributes. Domains are particularly useful for tracking field verification status. Not only do pick lists make field verification more efficient, they also ensure attributes will be entered consistently.

Once the initial fieldwork setup is complete, GeoComm will load the GIS data onto the laptops and configure them to receive GPS from the Trimble GeoXH units. The equipment will then be thoroughly tested to ensure accurate GPS tracking.

#### On-site Fieldwork

GeoComm's Field Specialists will visit each addressed structure in Hamilton County to field verify the accuracy of the County's existing address point layer. Point placement and attribute information for existing points will either be validated or corrected based on observations made in the field. Also, GPS points will be collected for any addressed structure that does not have a corresponding point in the address point layer. The result will be a complete, county-wide address point layer representing real-world structure addresses.

GeoComm's team of GIS Field Specialists will visit each addressed structure in Hamilton County to:

- verify the house number attribute assigned to the structure
- confirm street name, if there is a question or conflict in provided project resources

- verify sub-address information such as building name, unit number, etc. (if applicable)
- ensure an address point with corresponding attributes is located on the appropriate structure rooftop as depicted on aerial photography
- collect a GPS point for any habitable structures that do not have a corresponding point in the existing address point layer\*

\*Note: If an associated address point is not present in the initial address point layer, a GPS point will be collected as close as possible to the structure and then manually moved to the structure top as seen in the aerial photography or building footprint layer.

GeoComm is aware that certain locations may require an address however there is not physical structure associated with these locations. If an addressable location does not have a structure, GeoComm will place the address point at the center of the parcel, unless there is an obvious driveway access. If access to a parcel is obvious, then the address point will be placed at the access. Examples include parks, cemeteries, etc.

Multi-unit structures will be represented with individual points for each unit. GeoComm will work with Hamilton County to determine the standard protocol for placement of multi-unit points. This may include structure centroid or entrance location.

Address verification status will be tracked by GIS Specialists and color coded to visually show fieldwork progress. Status will be categorized as *visited and verified*, *visited and not verified*, *visited but not accessible*, or *visited and verified by resources*.

#### Visited and Verified

If a structure's address is clearly displayed, and that address is successfully associated with a corresponding existing address point, GeoComm will mark the point as *visited and verified* and move on to the next point.

If the structure's address is not visible or if it is determined to be otherwise questionable, GIS Specialists will conduct a face-to-face survey with available residents to obtain the correct address for the structure.

#### Visited and Not Verified

If a face to face survey is necessary to collect information but no one is available, GIS Specialists will mark the point as *visited and not verified*. An informational pamphlet will be left behind that will include information concerning the project as well as a link to an online survey to be completed by the resident or business.

As an alternative to the online survey, a toll-free phone number will also be provided for residents to call and verify their address with the GeoComm project team. Each survey is uniquely tied to a corresponding address point for easy cross-reference back to the GIS data. Upon receiving completed surveys or telephone calls from the residents in the area, GeoComm's in-house GIS Specialists will update the corresponding address information supplied and change the verification status to *visited and verified*.

### Visited but Not Accessible

If GIS Specialists are unable to access the structure to verify the address, they will categorize the structure as *visited but not accessible*. Situations that constitute inaccessibility include locked gates, washed out driveways, hostile residents, aggressive dogs, etc. In these instances, GeoComm will collect a GPS point at the location of the obstruction and record miscellaneous notes about the attempted site visit detailing why the structure was deemed inaccessible.

### Visited and Verified by Resources

If a house number is not visible, but neighboring house numbers have been field verified and a reliable secondary resource such as the parcel layer matches the address point attributes, the structure will be coded as *visited and verified by resources*. The exact process will be defined in the project plan after county-provided resources have been reviewed and ranked according to accuracy.

Structure points will contain address attributes based on information observed in the field, received through online surveys, confirmed directly over the phone, or based on other resources such as parcel data or neighbors. GIS Specialists will document the information source for each point. If an address is not available for a structure, GeoComm will work with Hamilton County to determine the correct address. If an address cannot be determined with county input after a 30 day time period, the address point will remain classified as Visit and Not Verified with notes detailing the verification attempts.

### Fieldwork Processing

Field verified data will be uploaded nightly to the GeoComm network and processed the following day by GeoComm's in-house GIS staff. A time date stamp is automatically generated each time a point is modified in the field, allowing Field Specialists to easily query and export work completed each day and giving in-house specialists the ability to monitor and track fieldwork progress. As an added benefit, this procedure offers a means of backing up field data to ensure no loss of data throughout the project.

Note: Daily fieldwork can alternatively be uploaded to the Hamilton County project portal where it would be accessible to authorized users, including Hamilton County's GIS staff.

Each morning, GeoComm's in-house GIS staff will import fieldwork from the previous day into the master GIS map data housed at GeoComm. Daily quality control checks will be performed by in-house GIS Specialists to ensure attribute consistency and accuracy. Missed or otherwise questionable points will be flagged and provided back to GIS Field Specialists to visit or revisit, if needed. The master address point layer will also be regularly distributed to GeoComm GIS Field Specialists so they will continually have access to the most current GIS data.

Daily fieldwork point totals will be tallied and visually maintained on a fieldwork progress map. This map will be updated daily and will be posted on the project management Web portal, allowing Hamilton County to monitor the most current fieldwork status at a glance.

## Potential Challenges

From past experience, GeoComm knows that unique challenges may be present during field verification. We have successfully overcome a variety of challenges in past projects and are prepared to handle those that may occur through address verification in Hamilton County. A few examples are described below.

Our fieldwork staff is not sidelined by inclement weather. We work rain or shine; therefore weather has a minimal impact on the overall project schedule.

All of GeoComm's fieldwork vehicles are equipped with 4 wheel drive to navigate steep and muddy terrain. We currently have a vehicle fleet which includes two Toyota Rav4s and three Hyundai Santa Fes.

Some areas of the county may require an enhanced level of security. GeoComm will work with Hamilton County to identify these areas prior to fieldwork and will take necessary precautions to ensure the safety of our field crew. This may include supplying GIS Field Specialists with pepper spray, police radios, and/or requesting an escort from local law enforcement.

Throughout the project, it is inevitable that new addresses will be assigned by city and county addressing authorities. GeoComm will work with Hamilton County to establish an address maintenance procedure for incorporating all new addresses assigned while the project is in progress.

## Task Four: Boundary Layer Updates

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To comply with the State of Tennessee's Minimum GIS Quality Requirements for NG9-1-1, GeoComm will make adjustments to Hamilton County's existing ESN, Community, and Zip Code layers. In addition to the specific updates outlined below and on the following page, GeoComm will ensure no gaps or overlaps exist between polygons and that boundaries are snapped to street centerlines where applicable.

### ESN Boundary Layer Updates

Hamilton County's existing ESN boundary layer will be updated based on inconsistencies identified during the analysis completed in Task Two. GeoComm will adjust the internal ESN boundaries for Hamilton County based on synchronization fallout from the analysis to ensure the ESN/ESZ information matches the MSAG and ALI database. ESN Boundaries will also be joined to jurisdictional boundaries where appropriate.

As needed, GeoComm will work with Hamilton County to determine the correct boundary delineation if it is not obvious from the provided project resources. Digital maps and/or shapefiles of the addresses in question will be provided to the County to assist in this effort. After updates are complete, GeoComm will provide a final ESN map to Hamilton County for verification and approval.

**Note:** GeoComm understands the Tennessee Emergency Communications Board (TECB) and OIR GIS have already reviewed and approved ESN boundaries at county borders, therefore, ESN boundary adjustment at the county boarder should not be necessary. If for some reason such boundary

adjustment is required, Hamilton County will be responsible for making these ESN adjustments and coordinating the adjustments with neighboring counties, Intrado, and OIR GIS.

### Community Boundary Layer Updates

GeoComm will make updates to Hamilton County's existing community boundary layer(s) based on synchronization results from the analysis completed in Step Two. Adjustments will be made to ensure the boundaries accurately reflect community information listed within the Hamilton County MSAG and ALI database. These layers will be used for updating community name attributes in the street centerline and address point layers. When updates are complete, GeoComm will provide Community boundary maps to Hamilton County for final verification and approval.

### Zip Code Boundary Layer Updates

GeoComm understands a tabular Zip+4 file containing accurate zip code boundary information is available from the OIR GIS Department. Hamilton County will need to grant permission allowing GeoComm to acquire this file from OIR GIS. GeoComm will then use the Zip+4 file as a resource for making adjustments to Hamilton County's zip code boundary layer. Once updates to the Zip Code boundary layer are complete, GeoComm will provide Zip Code boundary maps to Hamilton County for final verification, adjustment, and approval. Upon Hamilton County's approval of the updated Zip Code boundary layer, GeoComm will then use this layer to populate zip code attributes in the address point and street centerline layers.

### Task Five: Street Centerline Layer Updates

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GeoComm will update the Hamilton County street centerlines layer so it complies with State of Tennessee's Minimum GIS Quality Requirements for NG9-1-1. Updates will be based on information collected in the field, inconsistencies noted during the synchronization analysis, and boundary adjustments made in Task Five. The goal will be to generate a spatially accurate street centerline layer, with accurate, complete, and standardized attributes, that is 98 percent synchronized with the MSAG and ALI Database.

Street centerline update processes may include a combination of or all of the following:

- Spatial Adjustments
- Street Centerlines Name Attribute Updates
- Address Range Attribute Updates
- Topological Corrections
- Left/Right Refinement Field Updates

### Spatial Adjustments

GeoComm will review and adjust existing street centerlines, where needed, to aerial images. In compliance with the State of Tennessee's Minimum GIS Quality Requirements for NG9-1-1, the final street centerlines will fall within 10 feet or less of the centerline 95 percent of the time as visible on the aerial images. Spatial adjustment of roads that are not clearly visible on the aerial imagery is not included in

the scope of this project. GeoComm will mark these instances and provide them to Hamilton County for resolution.

GeoComm understands Hamilton County has a process in place for collecting new street centerlines. If it is determined that a road is missing from the street centerlines layer, GeoComm will notify the county that it needs to be added. Updated street centerline layers will be requested periodically from the Hamilton County GIS Department and newly added roads will be incorporated into the centerline layer as needed. Alternatively, GeoComm can collect missing roads in the field, upon request.

GeoComm is aware the State of Tennessee requires a centerline stitch point layer as part of its NG9-1-1 GIS data development efforts. This layer consists of a point representing geographic locations of street centerlines along neighboring county borders. If a stitch point layer representing connections between Hamilton County street centerlines and neighboring county street centerlines is available from OIR, GeoComm will snap Hamilton County street centerlines to the stitch points to ensure valid topology with neighboring counties. Any discrepancies between the existing stitch points and Hamilton County's street centerline layer will be noted and reported to Hamilton County.

#### Street Centerline Name Attribute Updates

GeoComm will update road names attributes in the street centerlines layer to correspond to authoritative road name resources provided by Hamilton County. Any conflicts in street name spelling between the street centerlines layer, MSAG, and ALI database will be documented and provided to Hamilton County for verification. Hamilton County is responsible for confirming the correct street name and providing that information to GeoComm. GeoComm will then make necessary updates to the street centerline layer.

Road names will also be updated to reflect NENA and USPS standard street name and street type abbreviations, where possible.\*

\*Note: GeoComm is aware that certain MSAG/ALI database providers are unable to accept NENA and USPS standard street names. In these cases, street name and street type abbreviations will be updated to match the MSAG and ALI Database. GeoComm understands the State will accept non-standard abbreviations in these instances. Non-standard abbreviations will be marked as such so the State can easily identify them as exceptions.

#### Address Range Attribute Updates

GeoComm's GIS Specialists will identify and correct the following address range issues in the street centerlines layer:

- Overlapping address ranges
- High address range is less than the low address range
- Odd/even address ranges in both the from and to attribute fields
- Address ranges of street centerlines that appear incorrect based on initial review
- Address ranges that do not account for field-verified addresses

### Topological Corrections

GeoComm will break and snap street centerline segments where necessary to create topological accuracy for proper location of 9-1-1 addresses and routing. Street centerlines will be broken at:

- Emergency Service Zone boundaries
- Community boundaries
- Zip Code boundaries
- True intersections with other street centerlines
- Address locations where the address point falls in a different boundary than
- Small centerline segments built to accommodate address points with different ESN or Community values than the street centerline the point is addressed from

In compliance with State of Tennessee Minimum GIS Requirements, roads should be broken all centerline intersections (including overpasses and underpasses) and from and to elevation attributes should be populated to indicate non-routable intersections. However, GeoComm is aware that breaking roads at overpasses/underpasses may cause routing problems in certain dispatch mapping applications. GeoComm will coordinate with Hamilton County to determine any conflicts this may cause with their dispatch mapping and break roads as required.

Line direction will also be adjusted on each street centerline segment to follow the direction of house number increase. For one-way streets, it is possible for house numbers to increase in the opposite direction of traffic flow. However, GeoComm is aware that adjusting the line direction to follow house number increase may cause routing problems in certain dispatch mapping applications. GeoComm will coordinate with Hamilton County to determine any conflicts this may cause with their dispatch mapping application and adjust line direction as required.

### Left/Right Refinement Field Updates

GeoComm will update left and right refining fields in the street centerline layer with attributes derived from polygon boundaries and other resources. Based on line direction, all road segments will be updated with the corresponding ESN, Community, Zip Code, County, and State that each side of the road falls within. Left/right refinement fields and their associated attribution methods are detailed in the table below.

Field Name	Attribution Method
ESN_L and ESN_R	After the ESN boundary layer has been updated and approved by Hamilton County, GeoComm will update these fields with the corresponding ESN for each side of the road.
CITY_L and CITY_R	After the Community boundary layers have been developed and approved by Hamilton County, GeoComm will update these fields with the corresponding MSAG community for each side of the road.
ZIP_L and ZIP_R	GeoComm will utilize a Zip+4 file available from OIR GIS for five digit zip code population.
COUNTY_L and COUNTY_R	The majority of the street centerlines will be populated with "HAMILTON" with the exception of bordering street centerlines which will have one side of the street populated with Hamilton County and the other populated with the bordering county's name.
STATE_L and STATE_R	The majority of the street centerlines will be populated with "TN" with the exception of bordering street centerlines, if applicable, which will have one side of the street populated with "TN" and the other populated with "GA."

To maximize efficiency, left/right fields will be updated using an automated tool. GeoComm will manually populate any left/right attributes which are not populated automatically.

#### **Task Six: Address Point Layer Updates**

As described in Task Three, GeoComm's GIS Field Specialists will update the address point layer to reflect field-verified addresses. GeoComm's in-house GIS staff will complete several additional updates to ensure the final address point layer meets State of Tennessee Minimum GIS Requirements for NC9-1-1.

After the street centerline, ESN Boundary, and Community Boundary layers have been updated as described in Tasks Four and Five, GeoComm will use them to synchronize attributes in the address point layer. Road names in the address point layer will be updated where necessary to mirror those in the roads layer. ESN and City attributes will be updated with values from the corresponding ESN and Community polygon boundary layers.

In addition, GeoComm will populate the following attributes as outlined below:

- **ZIP CODE** attributes based on approved zip code boundary layer.
- **STATE** attributes based on the county border represented by the ESN layer. Certain address points may fall out of state. Hamilton County must provide the required resources to determine if these address points should be classified as Tennessee or out-of-state.
- **COUNTY** attributes based on the county border represented by the ESN layer. Certain address points may fall outside county boundaries. Hamilton County must provide confirmation of the correct county attribution for any address points which fall outside the County.

## Task Seven: Quality Control and Synchronization

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Quality control is an integral part of all our projects. Over the years, GeoComm has developed and implemented a structured QA/QC curriculum specific to the GIS data needs of the public safety industry. GeoComm utilizes documented internal processes to ensure the highest quality of deliverables is developed. Our QA/QC program has evolved over the last 18 years and consists of over 50 tools and procedures to increase the accuracy of GIS data for public safety.

QA/QC occurs throughout the project. Numerous in-depth QA/QC procedures will be completed during Task Two and again at the end of the project to ensure the final map data is complete and accurate.

QA/QC audits will be performed on the:

- Street Centerlines Layer
- Address Points Layer
- ESN Boundary Layer
- Community Boundary Layers
- Zip Code Boundary Layer

A description of each audit follows.

### Street Centerlines Layer

GeoComm will perform several audits to ensure the overall quality of the street centerlines layer. The audits used for checking the street centerlines layer include:

- Address Range Audit – to identify overlapping address ranges that could cause addresses to geocode in the wrong location
- Topology Audit – to locate unbroken and unsnapped intersections that could cause routing issues
- Road Name Audit – to ensure road name integrity
- Missing Attribute Audit – to identify missing or invalid values in pertinent attribute fields

### Address Point Layer

GeoComm will perform several audits to ensure the quality of addresses in the final field-verified address point layer. The audits used for checking addresses include:

- Address Spacing Audit – to identify duplicate addresses
- Address Missing Attribute Audit – to identify missing or invalid values in pertinent attribute fields
- Address Sanity Audit - to ensure logical assignment of house numbers with respect to centerline\*

- **Address Odd/Even Parity Audit** – to identify addresses that are not in accordance with the standard addressing scheme (e.g. even addresses on odd side of road)\*
- **In-depth Visual Review** - to check spatial accuracy and point layer completeness relative to aerial imagery

\*Note: Audits marked with an asterisk (\*) will identify potential addressing issues such as house numbers that are out of sequence or odd/even addresses that exist on the wrong side of road. GeoComm will investigate these issues in the field and correct any addresses that are misrepresented in the GIS data. Legitimate addressing issues will be documented and provided to Hamilton County at the end of the project. Hamilton County will be responsible for correcting addressing issues which require a change of address.

### ESN Boundary, Community Boundary, and Zip Code Boundary Layers

GeoComm will complete several audits to ensure the overall quality of the ESN, Community, and Zip Code boundary layers. The audits used for checking these layers include:

- **Topology Audit** – to locate gaps and overlaps in polygon coverage
- **Missing Attribute Audit** – to identify missing or invalid values impertinent attribute fields
- **Duplicate Audit** – to check for duplicate or redundant attributes

### Multi-Layer Topology

The Multi-Layer Topology audit checks street centerline segments to ensure they are broken and snapped at ESN boundaries, Community boundaries, and Zip Code boundaries.

Errors discovered during QA/QC are corrected by GeoComm, or if they are outside the scope of this project, flagged for resolution by Hamilton County. Using a detailed QA/QC checklist outlining the above procedures, the data is reviewed by several members of our GIS Staff before being turned over to Hamilton County.

GeoComm guarantees the GIS map data developed under this agreement will be free of errors based on the resources provided by Hamilton County for one year from the date of delivery. This excludes any updates designated throughout this scope of work as county responsibilities. Any data errors discovered by Hamilton County within this period should be communicated to the project management team for immediate resolution.

### Final MSAG and ALI Synchronization Review

After the GIS data has passed through Quality Control, Hamilton County will be asked to provide updated copies of the MSAG and ALI database. Then, using procedures described in Task Two, GeoComm will complete a final review of the synchronization between the GIS map data layers, MSAG, and ALI database.

Hamilton County will be asked to clarify any issues GeoComm is unable to resolve based on provided resources or field verification. A list of errors with result codes will be provided to assist with verification, along with digital maps and/or shapefiles representing

discrepancies as needed. Hamilton County will be responsible for confirming the correct information and reporting back to GeoComm within 30 days. Based on this feedback, GeoComm will correct any errors found within the GIS data layers.

After the 30 day timeframe has expired and/or the necessary corrections have been made, GeoComm will provide the County with a final project close out report detailing remaining synchronization issues along with recommended updates to the MSAG and ALI database. Hamilton County would then be responsible for submitting the updates to Intrado.

#### Metadata

The final GIS data will be provided in Esri file geodatabase format with metadata for each layer. Metadata is a standard deliverable for all GeoComm's GIS projects. GeoComm will utilize the Esri ArcGIS metadata format which can be exported into several different formats, including FGDC. GeoComm utilizes the metadata functionality with Esri's ArcCatalog for delivering metadata information.

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#### Relinquishment of Data Rights

GeoComm will NOT retain any rights of ownership, copyrights, or distribution rights for the data created for Hamilton County. Upon completion of the project, the data will be delivered to Hamilton County for use at their discretion. In addition, GeoComm has an established level of security and follows standard operating procedures that eliminate the risk of unauthorized access to confidential customer data.

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#### Task Eight: SOP Development

GeoComm GIS Consultants will analyze Hamilton County's existing addressing and GIS data maintenance processes and develop a Standard Operating Procedure (SOP) consisting of maintenance workflows for making accurate and timely updates to the public safety GIS and related databases. The SOP will allow Hamilton County to easily follow a systematic approach for maintaining the GIS map data, ALI database, MSAG, and addressing. Additionally, the SOP will help to ensure ongoing compliancy with State requirements. Ongoing State compliancy, in turn, helps to ensure Hamilton County will continue to receive Incentive Funding provided by the Tennessee Emergency Communications Board (TECB).

Hamilton County currently utilizes GeoLynx DMS to maintain address information and other public safety related GIS data. This provides GeoComm with a unique understanding of Hamilton County's current methodology of data maintenance. Our own staff uses these very same tools on a daily basis and knows how they can best be integrated into a comprehensive maintenance workflow. The GeoLynx DMS tools currently in place in the Hamilton County GIS department can easily be incorporated into Standard Operating Procedures development. GeoLynx DMS reflects GeoComm's internal GIS data maintenance procedures which have been developed and refined over our 18 year history. The County GIS department will benefit from being able to follow the same time-tested procedures, using the same tools, to maintain their data moving forward.

Immediately following the on-site project kick-off meeting, GeoComm's GIS Consultant will conduct individual on-site meetings and interviews with project stakeholders to fully

understand existing maintenance processes. During these on-site meetings and interviews, GeoComm will undertake the following activities:

- Collect information regarding the current software in place
- Meet with relevant stakeholders to gather steps used in current processes
- Interview managers and staff relative to the perception of current processes
- Compile list of future needs and requests by the stakeholders
- Discuss technical parameters of existing systems
- Discuss existing addressing ordinances

These meetings will occur at a Hamilton County provided central location within a two day period. Agreed upon meeting times will be scheduled prior to arrival to ensure enough time is allotted to meet individually with each stakeholder and gather the needed information.

Following the meetings GeoComm's GIS Consultant will review meeting notes and the data gathered to complete a thorough analysis of existing processes. The Consultant will then develop draft documentation and provide preliminary copies of the maintenance workflows in Microsoft Visio format to Hamilton County for review. The diagrams will provide a step-by-step visual process for stakeholders to follow when completing GIS map data maintenance.

Maintenance workflow diagrams will include items such as:

- New address assignment
- Address verification
- Addition/adjustment to the centerlines
- Boundary changes
- MSAG maintenance
- PSAP mapping software updates
- QA/QC processes

After Hamilton County has had sufficient time to review the documentation, a working web session will be conducted to discuss and adjust the preliminary process diagrams. The GIS Consultant will work with county stakeholders to determine any missing requirements and will answer questions regarding maintenance workflow recommendations. This is an important step in the process as it allows stakeholders to review the draft plan and provide feedback. Following completion of the working web-session, the maintenance workflow documentation will be revised based on provided feedback.

During this time, the GIS Consultant will also work with Hamilton County to determine if specific processes would benefit from more detailed step by step instructions (SOP documents) to complement the Visio diagrams. These documents would be intended to provide additional detail, as identified by GeoComm and Hamilton County, pertaining to workflow steps, in order to offer further explanation beyond the Visio diagrams.

GeoComm's GIS Consultant will present the finalized maintenance workflows during an on-site meeting with project stakeholders. The goal of this on-site presentation is to

provide a solid understanding of GIS map data maintenance concepts. The final process presentation and discussion may include:

- Interdepartmental communication for GIS map data maintenance workflow
- NENA, USPS, and TIPS standards
- Options for timely and accurate GIS map data and database updates
- GIS map data and database synchronization
- Overview of GIS map data provisioning to dispatch mapping software (if applicable)
- Evaluation and adjustment of workflows
- Identification of software that could enhance the maintenance workflows
- Identification of staffing and training needs

Over the course of the project, the GeoComm GIS consultant will work closely with Hamilton County stakeholders to clearly identify the county's needs related to each of these elements.

In addition to an on-site process presentation/discussion, there will be two hours of web-based support which allows Hamilton County to receive web-based follow-up support from GeoComm regarding the workflows. The two hours can be scheduled in half-hour or greater increments within the first 30 days following the maintenance workflow presentation.

A maintenance workflow presentation plan is depicted in the following table:

Course Title	Duration	Participants	Number of Sessions
Maintenance Workflow Presentation and Discussion	Up to 4 hours	Required Department Representatives	1
Maintenance Workflow Support	Up to 2 hours	n/a	n/a

### GeoComm Deliverables

The aforementioned tasks will result in the following deliverables for Hamilton County:

Project Task	Project Deliverable
Task One – Public Awareness	Public awareness materials informing residents and businesses about the project and the field collection methods used
Task Two – Resource Collection, Review, and Analysis	A pre-project analysis report outlining discrepancies and inconsistencies in the address point, road centerline, ESZ, and community boundary layers as well as synchronization issues between the GIS data, MSAG, and ALI database
Task Three – Field Verification of Address Data	Countywide address point layer containing structure address numbers that have been field verified and NENA and USPS standard street names

Project Task	Project Deliverable
Task Four – Boundary Layer Updates Task Five – Street Centerline Layer Updates Task Six – Address Point Layer Updates	GIS map data layers in Esri file geodatabase format with FGDC metadata, updated to meet State of Tennessee Minimum GIS Quality Requirements for NQ9-1-1, including: Address Points Street Centerlines Emergency Service Zone Boundaries Community Boundaries Zip Code Boundaries
Task Seven – Quality Control and Final Synchronization Review	Final GIS/MSAG/ALI database synchronization report, including suggested ALI database and MSAG updates
Task Eight - Standard Operating Procedure (SOP) Development	Standard Operating Procedures for ongoing maintenance of the provided GIS data layers including workflow documentation and Visio diagrams

Throughout the project, GeoComm will also provide:

- On-site project initiation meeting
- Bi-weekly status reports
- Monthly status calls
- Overall project planning, project management, and coordination
- Project management web portal

We believe our clients play a critical role in the overall project success. From time to time throughout the project we will seek your input because no one understands the available resources, local terrain, politics, and needs like the people who live and work within your community. Also, as the contracting agency, you are looked to for project accountability by community members. So while GeoComm will lead the project efforts, we will partner with you to ensure you have in-depth project knowledge and are informed regarding the status of meeting project goals.

It is requested that Hamilton County will provide the following project support:

- \* Designate a single point of contact at the county who will be available for communication throughout the project
- \* Assist in coordinating and attend periodic conference calls
- \* Provide pertinent project resources including:
  - o existing GIS data layers and project resource information
  - o aerial images in a standard agreed format, e.g. TIFF, BIL, Mr. SID, etc., including the corresponding world file (images must be rectified)
  - o digital copies of Hamilton County's MSAG and ALI database, in a standard format (.txt, .xls, or ascii)
  - o master list of authoritative road names (if different from MSAG)
  - o other hard copy or digital resources, as needed, to complete project
- \* Assist in the public awareness campaign, as needed
- \* Assist in reviewing ESN, community, and zip code boundaries
  - o Provide resources depicting adjustments required.
  - o Provide final approval
- \* Work with GeoComm to ensure proper routing enhancements (e.g. line direction, breaking roads at overpasses/underpasses, etc.) to the road centerline are made to work properly with county dispatch mapping application
- \* Provide addresses for structure points that were not available in the field or provided via online surveys or telephone call from the resident/business owner within 30 days of GeoComm providing identified structure points without addresses
- \* Provide clarification of GIS Data, MSAG, and ALI database synchronization issues within 30 days of GeoComm providing identified discrepancies
- \* Submit MSAG and ALI database updates to Intrado based on GeoComm's recommendations
- \* Provide authorization to use existing OIR stitch point layer (if applicable)
- \* Make any necessary ESN boundary adjustments along county borders and coordinate the adjustments with neighboring counties and OIR GIS
- \* Coordinate all updates which require change of address

**Exhibit - D**

**GIS Requirements**

Minimum GIS quality requirements for NG9-1-1, as outlined on the Tennessee Emergency Communications Board website, are listed on the following pages. Work completed by GeoComm under this agreement will assist Hamilton County in meeting the majority of Minimum GIS quality requirements for NG9-1-1. Full compliancy with Minimum GIS quality requirements for NG9-1-1 will require Hamilton County's full participation in discrepancy resolution. Also, additional services may be needed to meet certain requirements. The following pages provide a list of requirements both covered and not covered under this agreement.

	<b>Requirement</b>	<b>Requirement Met Under This Agreement?</b>
Data layers present in all GIS maps	Street Centerlines	Yes
	Address Points	Yes
	Emergency Service Zone Boundaries (ESN Boundaries)	Yes
GIS data maintenance of Street Centerlines	Updated monthly and maintained on a continual basis	County Requirement <sup>*9</sup>
	Accurately reflect block address ranges as related to Address Points	Yes <sup>*7</sup>
	Fall within 10 feet or less of the centerline 95% of the time as visible in Ortho Photography	Yes
	Represent all public and addressed private streets	Yes <sup>*4</sup>
	Attributes are accurate, complete and standardized (address ranges, ESN's, Communities, spelling abbreviations)	Yes <sup>*10</sup>
	All related NENA standards are met or exceeded	Yes <sup>*10</sup>
	The MSAG is reviewed for accuracy by the ECD and synchronized with the GIS data (see NENA 71-501)	County Requirement
	GIS data layers contain all valid addressing information after corrections to ALI and MSAG records are made	Yes
	Street Centerlines match corrected MSAG to a 98 percent or higher rate	Yes <sup>*1</sup>
	Street names include the street centerline attributes	Yes
	Street names conform to the legal names as assigned by the addressing authority	Yes
	Correct all errors, incomplections, missing or inconsistent road names	Yes
	Abbreviations of all Street Prefixes and Suffixes are incorporated according to NENA Standards	Yes <sup>*10</sup>
	MSAG Communities are populated with correct information, spelled out and consistent	Yes
	Include all attribute information such as ESN, Community, etc.	Yes
	Include County names that are consistently attributed	Yes
	Assure that lower address ranges are lower than high address ranges	Yes <sup>*2</sup>
	Attempt to assure that Left and Right addressing is consistently either odd or even addresses; document unsuccessful attempts	Yes <sup>*5</sup>
	No overlapping address ranges exist	Yes

	Orient all line segments in the direction of increasing address ranges	Yes <sup>*8</sup>
	Each centerline segment shares an exact begin or end node with another centerline segment	Yes
	Each intersection is split for routing and intersection lookup purposes	Yes <sup>*3</sup>
	Street centerlines are split at intersections with ESN boundaries, City Boundaries and County Boundaries	Yes
GIS data maintenance of Address Points	Updated daily or as needed	County Requirement <sup>*9</sup>
	Located either on the structure or on the driveway whichever will best route emergency vehicles accurately	Yes
	Include valid attribute values	Yes <sup>*11</sup>
	Not contain duplicate address points – each address point should be uniquely identifiable by the attributes	Yes
	Attempt to assure that Address points on the left or right of the street centerline are consistently either odd or even addresses; document unsuccessful attempts	Yes <sup>*6</sup>
	Site address matches ALI data base	Yes <sup>*1</sup>
	Address Points match corrected MSAG/ALI to 98 percent or higher rate	Yes <sup>*1</sup>
GIS data maintenance of ESN Boundaries	Updated as needed to stay current and accurate with streets, address points and community boundaries	County Requirement <sup>*9</sup>
	No gap or overlapping polygons	Yes
	ESN Boundaries joined to jurisdictional boundaries where appropriate	Yes
	ESN, ESZ info matches MSAG/ALI	Yes <sup>*1</sup>
	ESN Boundaries match Street Centerlines and Address points to a 98 percent or higher rate	Yes

\*1 GeoComm will provide Hamilton County with a list of suggested updates to the MSAG and ALI database. To ensure a 98% match rate, Hamilton County is responsible for submitting these updates to the database provider. The database provider's efforts may affect project timeline. GeoComm is not responsible for any project delays caused by the database provider.

\*2 GeoComm will adjust the street centerline address ranges to ensure low and high values are consistent with the standards above. In certain situations changing the low and high values may create conflicts with other layers and attributes. Through data analysis, GeoComm may identify address intervals which do not consistently increase along the road as traveled (e.g. address 200, address 250, address 225, address 223, address 300). These physical addresses may be associated with address ranges contained within the street centerlines. Changing the address ranges within the street centerlines may cause discrepancies when geocoding and creating future addresses. When possible, GeoComm will adjust street centerline ranges that do not cause such discrepancies. If adjusting address ranges causes discrepancies with existing physical addresses, GeoComm will report these situations to Hamilton County. Hamilton County will need to advise GeoComm on the best way to proceed. In some cases these situations will require re-addressing by the county in order to meet state standards or they will need to be marked as an exception for the state auditing process.

\*3 Street centerline intersections will be broken in compliance with state standards for routing purposes and intersection lookup. One stipulation to this requirement concerns overpasses. The TIPS document currently requires all overpasses to be broken at the intersection and elevation values added for routing purposes. Through discussions with OIR GIS GeoComm understands this requirement for overpasses may change. With this change overpasses will not be broken in order to allow for non-planar routing. GeoComm will eliminate street centerline breaks at overpasses. This may also affect Hamilton County's

current and future CAD/Mapping system as it relates to street centerline routing. Hamilton County is required to consult with their current and future CAD/Mapping vendor and advise GeoComm on routing requirements related to overpasses.

\*4 GeoComm will update the street centerlines to reflect all public and private addressable streets based on the resource data provided by Hamilton County. Streets that are not included in the provided data resources will not be updated.

\*5 GeoComm will update street centerlines and attempt to assure that left and right addressing is consistently either odd or even addresses. In some instances updating these values may produce inconsistencies between the street centerline data and other reference data. GeoComm will update street centerline's left and right addressing where possible. GeoComm will flag unsuccessful attempts. Hamilton County will be responsible for making the final decision on unsuccessful attempts and coordinating these instances with OIR GIS.

\*6 GeoComm will update the address points layer and attempt to assure that address points on the left or right of the street centerline are consistently either odd or even addresses. In many cases updating these odd/even values of the address points consistently to the left or right side of the centerline may require re-addressing. GeoComm will flag these instances and provide them to Hamilton County. Hamilton County will be responsible for making the final decision and coordinating any unsuccessful attempts or exceptions with OIR GIS.

\*7 GeoComm will adjust the street centerline address range attributes to accurately reflect block address ranges as related to address points. In some instances block range values cannot be adjusted without affecting adjacent block ranges which may already align properly with the address points. In these instances GeoComm will not adjust block range values but will flag the related roads and provide a list to Hamilton County. Hamilton County is required to provide input for correcting these issues within the timeframe as specified in this agreement. If input is provided within the specified timeframe, GeoComm will update the block range values based on Hamilton County's input. Hamilton County may also choose to correct these values themselves.

\*8 In compliance with TIPS standards, GeoComm will update the street centerline direction to orient all line segments in the direction of increasing address ranges. An exception to this rule may be one-way streets. Depending on the specific requirements of Hamilton County's Dispatch Mapping Software, line direction may be required to follow the direction of travel. For one-way streets the direction of travel may be opposite to the direction of increasing addresses. If this is true of Hamilton County's Dispatch Mapping software, the county will be required to provide GeoComm with input on one-way street line direction and must also address the deviation from TIPS standards with OIR GIS.

\*9 GeoComm's maintenance workflow development and training will outline recommended procedures for Hamilton County staff to follow in order to effectively keep the GIS data up to date after project completion. Ultimately, however, ongoing maintenance is a county responsibility.

\*10 GeoComm understands certain MSAG/ALI providers are unable to accept NENA/TIPS-standard road name suffix abbreviations. Therefore, updating the road name suffix information in the GIS data will produce unmatched records in the audits performed by OIR GIS. For instances where the MSAG/ALI provider requires non-standard road name suffix abbreviations, GeoComm will update the GIS data with the non-standard abbreviations then record the NENA/TIPS standard abbreviation in a separate field. This will allow Hamilton County easily identify and report non-standard abbreviations as exceptions to OIR GIS. Additionally this will also provide Hamilton County with a simple method to update to NENA/TIP standard abbreviations should MSAG/ALI provider requirements change.

\*11 While every effort will be made to ensure the accuracy of the final address point layer, in some cases it may be impossible to confirm a structures address. If the address is not posted, an occupant is not available to confirm the address, and a leave-behind survey is not returned, GeoComm will work with Hamilton County to determine the correct address. Despite all efforts made by GeoComm and Hamilton County, the potential for non-confirmed address information exists. Therefore, GeoComm does not guarantee all address points will have a valid address.

**Exhibit - E      Incorporation of Additional Documents**

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- a. Request for proposal and/or bid specifications and its associated amendments
- b. Contracting Party's Proposal/Bid Response documents and amendments