



TRANSMITTAL LETTER

Alabama 9-1-1 Board

Reference: AL-GIS-RFP-19-002

1 Commerce Street
Suite 620
Montgomery, AL 36104

January 12, 2020

Dear Alabama 9-1-1 Board:

This letter serves as DDTI's Letter of Transmittal for AL-GIS-RFP-19-002. We are confident our extensive experience preparing GIS data for NG9-1-1 deployments and our proven NG9-1-1 software solutions will fully satisfy the requirements of the RFP in a cost-effective manner. Our proposal will be binding for 240 days following the Proposal opening date.

Agreement with Requirements listed in Section 1 - General Instructions

DDTI understands the general information presented in Section 1 and agrees with the requirements/conditions listed.

DDTI has no current or outstanding criminal, civil, or enforcement actions initiated by the State, and agrees that it will immediately notify the State of any such actions. DDTI also certifies that neither it nor its principals are presently in arrears in payment of its taxes, permit fees or other statutory, regulatory or judicially required payments to the State.

DDTI agrees that the State may confirm, at any time, that no such liabilities exist, and, if such liabilities are discovered, that the Board may bar DDTI from contracting with the Board, cancel existing contracts, withhold payments to setoff such obligations, and withhold further payments or purchases until the entity is current in its payments on its liability to the State and has submitted proof of such payment to the State.

DDTI agrees to comply with the provisions of the Americans with Disabilities Act of 1990 (42 U.S.C. 12101 *et seq.* and 47 U.S.C. 225).

Summary of Ability and Desire to Supply the Required Products or Services

Based on DDTI's past performance on engagements requiring business objectives substantially identical to those required by the Alabama 9-1-1 Board, we are highly confident we can accomplish the stated business objectives and achieve industry standards compliance with quality, cost effectiveness and timeliness.

DDTI's value to the Alabama 9-1-1 Board includes:

- DDTI is an established business partner with INdigital.
- DDTI has experience supporting a phased approach to NG9-1-1 implementations. This includes utilizing service area boundaries to geospatially route cellular calls, GIS data normalization projects and the successful replacement of a statewide ALI system with a Location Database (LDB).
- The tools and processes provided by DDTI for this project will make the transition to NG9-1-1 faster and simpler. The standardized and corrected datasets will be provisioned into the ECRF/LVF utilizing the Spatial Interface (SI) capability.
- Jurisdictions will not be required to alter their existing GIS data structures to build the authoritative regional GIS model. As data is submitted and quality controlled, it is transformed into the NENA CLDXF format.
- An ESRI web layer is available to jurisdictions to display QA/QC errors and facilitate data corrections utilizing familiar ESRI software tools.

DDTI's willingness to provide the requested products and/or services will be subject to the terms and conditions set forth in the RFP including, but not limited to, mandatory contract clauses.

Respondent Notification

DDTI understands it will receive notification via email and will notify the Board of any changes in any address that may have occurred since the origination of this solicitation.

Principal Contact

Digital Data Technologies, Inc.
2323 W. Fifth Avenue, Suite 210
Columbus, OH 43204
Attn: **Dan Casey**, Chief Business Development Officer
(614) 429-3384 ext. 223
dcasey@DDTI.net

I certify that the information offered in this proposal meets all general conditions, including the information requested in Section 2.3.4 - Integrity of Company Structure and Financial Reporting.

Respectfully Submitted,

A handwritten signature in blue ink, appearing to read "Ron Cramer", is written over a horizontal line.

Ron Cramer, CEO
rcramer@DDTI.net

Attachment A – Sample Contract Terms and Conditions

CONTRACT FOR SERVICES

This Contract (“Contract”), entered into by and between the Alabama 911 Board (the “Board”) and _____ (the “Contractor”), is executed pursuant to the terms and conditions set forth herein. In consideration of those mutual undertakings and covenants, the parties agree as follows:

1. Duties of Contractor. The Contractor shall provide the following services relative to this Contract:

[Scope of services to be inserted here and as Appendices/Exhibits upon award of Contract]

2. Consideration. The Contractor shall be compensated for services performed under this Contract as follows:

[Fee information to be inserted upon award of Contract]

3. Term. This Contract shall be effective for a period of [__TBD__]. It shall commence on [__TBD__] and shall remain in effect through [__TBD__].

4. Access to Records. The Contractor and its subcontractors, if any, shall maintain all books, documents, papers, accounting records, and other evidence pertaining to all costs incurred and payments made under this Contract. They shall make such materials available at their respective offices at all reasonable times during this Contract, and for three (3) years from the date of final payment under this Contract, for inspection by the Board or its authorized designees. Copies shall be furnished at no cost to the Board if requested.

5. Assignment; Successors. The Contractor binds its successors and assignees to all the terms and conditions of this Contract. The Contractor shall not assign or subcontract the whole or any part of this Contract without the Board’s prior written consent. The Contractor may assign its right to receive payments to such third parties as the Contractor may desire without the prior written consent of the Board, provided that the Contractor gives written notice (including evidence of such assignment) to the Board thirty (30) days in advance of any payment so assigned. The assignment shall cover all unpaid amounts under this Contract and shall not be made to more than one party.

6. Assignment of Antitrust Claims. As part of the consideration for the award of this Contract, the Contractor assigns to the Board all right, title and interest in and to any claims the Contractor now has, or may acquire, under state or federal antitrust laws relating to the products or services which are the subject of this Contract.

7. Audits. The Contractor acknowledges that it may be required to submit to an audit of funds paid through this Contract. Any such audit shall be conducted in accordance with Chapter 2A, Title 40 Ala. Code, 1975, and audit guidelines specified by the Board.

The Board considers the Contractor to be a “vendor” for purposes of this Contract. However, if required by applicable provisions of the Office of Management and Budget Circular A-133 (Audits of States, Local Governments, and Non-Profit Organizations), following the expiration of this Contract the Contractor shall arrange for a financial and compliance audit of funds provided by the Board pursuant to this Contract. Such audit is to be conducted by an independent public or certified public accountant and performed in accordance with industry best practice and applicable provisions of the Office of Management and Budget Circulars A-133 (Audits of States, Local Governments, and Non-Profit Organizations). The Contractor is responsible for ensuring that the audit and any management letters are completed and forwarded to the Board in accordance with the terms of this Contract. Audits conducted pursuant to this paragraph must be submitted no later than nine (9) months following the close of the Contractor’s fiscal year. The Contractor agrees to provide the Board an original of all financial and compliance audits. The audit shall be an audit of the actual entity, or distinct portion thereof that is the Contractor, and not of a parent, member, or Subsidiary Corporation of the Contractor, except to the extent such an expanded audit may be determined by the Board to be in the best interests of the Board. The audit shall include a statement from the Auditor that the Auditor has reviewed this Contract and that the Contractor is not out of compliance with the financial aspects of this Contract.

8. Authority to Bind Contractor. The signatory for the Contractor represents that he/she has been duly authorized to execute this Contract on behalf of the Contractor and has obtained all necessary or applicable approvals to make this Contract fully binding upon the Contractor when his/her signature is affixed, and accepted by the Board.

9. Changes in Work. The Contractor shall not commence any additional work or change the scope of the work until authorized in writing by the Board. The Contractor shall make no claim for additional compensation in the absence of a prior written approval and amendment executed by all signatories hereto. This Contract may only be amended, supplemented or modified by a written document executed in the same manner as this Contract.

10. Compliance with Laws.

A. The Contractor shall comply with all applicable federal, state, and local laws, rules, regulations, and ordinances, and all provisions required thereby to be included herein are hereby incorporated by reference. The enactment or modification of any applicable state or federal statute or the promulgation of rules or regulations thereunder after execution of this Contract shall be reviewed by the Board and the Contractor to determine whether the provisions of this Contract require formal modification.

B. The Contractor and its agents shall abide by all ethical requirements that apply to persons who have a business relationship with the Board as set forth in The Alabama Ethics Law Sections 36-25-1 et seq. Ala. Code, 1975, as amended and the regulations promulgated thereunder. If the Contractor is not familiar with these ethical requirements, the Contractor should refer any questions to the Alabama State Ethics Commission. If the Contractor or its agents violate any applicable ethical standards, the Board may, in its sole discretion, terminate this Contract immediately upon notice to the Contractor. In addition, the Contractor may be subject to penalties

under The Alabama Ethics Law at Section 36-25-27 Ala. Code, 1975, as amended and under any other applicable laws.

C. The Contractor certifies by entering into this Contract that neither it nor its principal(s) is presently in arrears in payment of taxes, permit fees or other statutory, regulatory or judicially required payments to the Board or the State of Alabama. The Contractor agrees that any payments currently due to the Board or the State of Alabama may be withheld from payments due to the Contractor. Additionally, further work or payments may be withheld, delayed, or denied and/or this Contract suspended until the Contractor is current in its payments and has submitted proof of such payment to the Board.

D. The Contractor warrants that it has no current, pending or outstanding criminal, civil, or enforcement actions initiated by the Board or the State of Alabama and agrees that it will immediately notify the Board of any such actions. During the term of such actions, the Contractor agrees that the Board may delay, withhold, or deny work under any supplement, amendment, change order or other contractual device issued pursuant to this Contract.

E. If a valid dispute exists as to the Contractor's liability or guilt in any action initiated by the Board or the State of Alabama or any affiliated agencies, and the Board decides to delay, withhold, or deny work to the Contractor, the Contractor may request that it be allowed to continue, or receive work, without delay. The Contractor must submit, in writing, a request for review to the Board. A determination by the Board shall be binding on the parties. Any payments that the Board may delay, withhold, deny, or apply under this section shall not be subject to penalty or interest.

F. The Contractor warrants that the Contractor and its subcontractors, if any, shall obtain and maintain all required permits, licenses, registrations, and approvals, and shall comply with all health, safety, and environmental statutes, rules, or regulations in the performance of work activities for the Board. Failure to do so may be deemed a material breach of this Contract and grounds for immediate termination and denial of further work with the Board.

G. The Contractor affirms that, Contractor is properly registered and owes no outstanding reports to the Alabama Secretary of State.

DDTI Comment: DDTI will register with the Alabama Secretary of State when and if selected to perform the work defined in AL-GIS-RFP-19-002.

11. Condition of Payment. All services provided by the Contractor under this Contract must be performed to the Board's reasonable satisfaction and in accordance with all applicable federal, state, local laws, ordinances, rules and regulations. The Board shall not be required to pay for work found to be unsatisfactory, inconsistent with this Contract, or performed in violation of and federal, state or local statute, ordinance, rule or regulation.

12. Confidentiality of Board Information. The Contractor understands and agrees that data, materials, and information disclosed to the Contractor may contain confidential and protected information. The Contractor covenants that data, material, and information gathered, based upon

or disclosed to the Contractor for the purpose of this Contract will not be disclosed to or discussed with third parties without the prior written consent of the Board.

The parties acknowledge that the services to be performed by Contractor for the Board under this Contract may require or allow access to data, materials, and information containing Personally Identifiable Information (defined as any information that identifies or can be used to identify, contact or locate the person to whom such information pertains or from which identification or contact information on an individual can be derived). If any Social Security number(s) is/are disclosed by Contractor, Contractor agrees to pay the cost of the notice of disclosure of a breach of the security of the system in addition to any other claims and expenses for which it is liable under the terms of this contract.

13. Continuity of Services.

A. The Contractor recognizes that the service(s) to be performed under this Contract are vital to the Board and the State of Alabama and must be continued without interruption and that, upon Contract expiration or termination, a successor, either the Board or another contractor, may continue them. The Contractor agrees to:

- 1. Furnish phase-in training; and*
- 2. Exercise its best efforts and cooperation to affect an orderly and efficient transition to a successor.*

DDTI Comment: DDTI software is proprietary and cannot be operated by another vendor. DDTI will provide transition services and data extracts to ensure information may be imported into alternative systems should the Board decide to discontinue services.

B. The Contractor shall, upon the Board's written notice:

- 1. Continue to provide services during the transition of services period for up to six (6) months after this Contract is terminated or expires; and**
- 2. Negotiate in good faith a plan with the Board and any successor to determine the nature and extent of phase-in, phase-out services necessary to transition operation. The plan shall specify a training program and a date for transferring responsibilities for each of the service areas provided, and shall be subject to the Board's approval. The Contractor shall provide sufficient experienced personnel during the phase-in, phase-out period to ensure that the services called for by this Contract are maintained at the required level of proficiency.**

C. The Contractor shall allow as many personnel as practicable to remain on the job to help the successor maintain the continuity and consistency of the services required by this Contract. The Contractor shall also disclose necessary personnel records and allow the successor to conduct on-site interviews with these employees. If selected employees are agreeable to the change, the Contractor shall release them at a mutually agreeable date and negotiate transfer of their earned fringe benefits to the successor.

DDTI Comment: DDTI will provide personnel to assist with the transition to another vendor but will not agree to release its employees to a successor.

D. The Contractor shall be reimbursed for reasonable phase-in, phase-out costs (i.e., costs incurred within the agreed period after contract expiration that result from phase-in, phase-out operations). Any costs eligible for reimbursement shall not exceed the monthly recurring cost being paid for the services provided under this contract at the time of contract expiration and as approved by the Board.

14. Debarment and Suspension.

A. The Contractor certifies by entering into this Contract that neither it nor its principals nor any of its subcontractors are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from entering into this Contract by any federal agency or by any department, agency or political subdivision of the State of Alabama. The term “principal” for purposes of this Contract means an officer, director, owner, partner, key employee or other person with primary management or supervisory responsibilities, or a person who has a critical influence on or substantive control over the operations of the Contractor.

B. The Contractor certifies that it has verified the state and federal suspension and debarment status for all subcontractors receiving funds under this Contract and shall be solely responsible for any recoupment, penalties or costs that might arise from use of a suspended or debarred subcontractor. The Contractor shall immediately notify the Board if any subcontractor becomes debarred or suspended, and shall, at the Board’s request, take all steps required by the Board to terminate its contractual relationship with the subcontractor for work to be performed under this Contract.

15. Default by Board. If the Board, ninety (90) days after receipt of written notice, fails to correct or cure any material breach of this Contract, the Contractor may cancel and terminate this Contract and institute measures to collect monies due up to and including the date of termination.

16. Disputes.

A. Should any disputes arise with respect to this Contract, the Contractor and the Board agree to act immediately to resolve such disputes. Time is of the essence in the resolution of disputes.

B. The Contractor agrees that, the existence of a dispute notwithstanding, it will continue without delay to carry out all of its responsibilities under this Contract that are not affected by the dispute. Should the Contractor fail to continue to perform its responsibilities regarding all non-disputed work, without delay, any additional costs incurred by the Board or the Contractor as a result of such failure to proceed shall be borne by the Contractor, and the Contractor shall make no claim against the Board for such costs.

C. If a party to the Contract is not satisfied with the progress toward resolving a dispute, the party must notify in writing the other party of this dissatisfaction. Upon written notice, the parties have ten (10) working days, unless the parties mutually agree to extend this period, following the notification to resolve the dispute. If the dispute is not resolved within ten (10) working days, the

parties shall submit the dispute, in compliance with the recommendations to the Attorney General, when considering settlement of such disputes, to utilize appropriate forms of alternate dispute resolution, including, but not limited to, mediation by or through the Attorney General's Office of Administrative Hearing or where appropriate, private mediators. If a party is not satisfied with the results of mediation, the dissatisfied party may submit the dispute to the Circuit Court of Montgomery County, Alabama.

D. The Board may withhold payments on disputed items pending resolution of the dispute. The unintentional nonpayment by the Board to the Contractor of one or more invoices not in dispute in accordance with the terms of this Contract will not be cause for the Contractor to terminate this Contract.

E. It is agreed that the terms and commitments contained herein shall not be constituted a debt of the State of Alabama in violation of Article XI, Section 213, of the Constitution of Alabama, 1901, as amended by Amendment No. 26. It is further agreed that if any provision of this contract shall contravene any statute or constitutional provision or amendment, either now in effect or which may, during the course of this contract, be enacted, then that conflicting provision of the contract shall be null and void.

17. Drug-Free Workplace Certification. The Contractor hereby covenants and agrees to make a good faith effort to provide and maintain a drug-free workplace. The Contractor will give written notice to the Board within ten (10) days after receiving actual notice that the Contractor, or an employee of the Contractor in the State of Alabama, has been convicted of a criminal drug violation occurring in the workplace. False certification or violation of this certification may result in sanctions including, but not limited to, suspension of contract payments, termination of this Contract and/or debarment of contracting opportunities with the Board for up to three (3) years.

In addition to the provisions of the above paragraph, if the total amount set forth in this Contract is in excess of \$25,000.00, the Contractor certifies and agrees that it will provide a drug-free workplace by:

- A. Publishing and providing to all of its employees a statement notifying them that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the Contractor's workplace, and specifying the actions that will be taken against employees for violations of such prohibition;
- B. Establishing a drug-free awareness program to inform its employees of (1) the dangers of drug abuse in the workplace; (2) the Contractor's policy of maintaining a drug-free workplace; (3) any available drug counseling, rehabilitation and employee assistance programs; and (4) the penalties that may be imposed upon an employee for drug abuse violations occurring in the workplace;
- C. Notifying all employees in the statement required by subparagraph (A) above that as a condition of continued employment, the employee will (1) abide by the terms of the statement;

and (2) notify the Contractor of any criminal drug statute conviction for a violation occurring in the workplace no later than five (5) days after such conviction;

- D. Notifying the Board in writing within ten (10) days after receiving notice from an employee under subdivision (C)(2) above, or otherwise receiving actual notice of such conviction;
- E. Within thirty (30) days after receiving notice under subdivision (C)(2) above of a conviction, imposing the following sanctions or remedial measures on any employee who is convicted of drug abuse violations occurring in the workplace: (1) taking appropriate personnel action against the employee, up to and including termination; or (2) requiring such employee to satisfactorily participate in a drug abuse assistance or rehabilitation program approved for such purposes by a federal, state or local health, law enforcement, or other appropriate agency; and
- F. Making a good faith effort to maintain a drug-free workplace through the implementation of subparagraphs (A) through (E) above.

18. Employment Eligibility Verification. As required by Alabama state law, the Contractor swears or affirms under the penalties of perjury that the Contractor does not knowingly employ an unauthorized alien. The Contractor further agrees that:

A. The Contractor shall enroll in and verify the work eligibility status of all his/her/its newly hired employees through the E-Verify program as defined in IC §22-5-1.7-3. The Contractor is not required to participate should the E-Verify program cease to exist. Additionally, the Contractor is not required to participate if the Contractor is self-employed and does not employ any employees.

B. The Contractor shall not knowingly employ or contract with an unauthorized alien. The Contractor shall not retain an employee or contract with a person that the Contractor subsequently learns is an unauthorized alien.

C. The Contractor shall require his/her/its subcontractors, who perform work under this Contract, to certify to the Contractor that the subcontractor does not knowingly employ or contract with an unauthorized alien and that the subcontractor has enrolled and is participating in the E-Verify program. The Contractor agrees to maintain this certification throughout the duration of the term of a contract with a subcontractor.

The Board may terminate for default if the Contractor fails to cure a breach of this provision no later than thirty (30) days after being notified by the Board.

19. Employment Option. If the Board determines that it would be in the Board's best interest to hire an employee of the Contractor, the Contractor will release the selected employee from any non-competition agreements that may be in effect. This release will be at no cost to the Board or the employee.

DDTI Comment: Given the proprietary nature of our software and the value of DDTI's employees, DDTI will not agree to waive non-competition agreements or allow employees to be hired.

20. Force Majeure. In the event that either party is unable to perform any of its obligations under this Contract or to enjoy any of its benefits because of natural disaster or decrees of governmental bodies not the fault of the affected party (hereinafter referred to as a "Force Majeure Event"), the party who has been so affected shall immediately give notice to the other party and shall do everything possible to resume performance. Upon receipt of such notice, all obligations under this Contract shall be immediately suspended. If the period of nonperformance exceeds thirty (30) days from the receipt of notice of the Force Majeure Event, the party whose ability to perform has not been so affected may, by giving written notice, terminate this Contract.

21. Funding Cancellation. When the Board makes a written determination that funds are not authorized by statute or otherwise available to support continuation of performance of this Contract, this Contract shall be canceled. A determination by the Board that funds are not authorized or otherwise available to support continuation of performance shall be final and conclusive.

22. Governing Law. This Contract shall be governed, construed, and enforced in accordance with the laws of the State of Alabama, without regard to its conflict of laws rules. Suit, if any, must be brought in the Circuit Court of Montgomery County, Alabama.

23. Indemnification. The Contractor agrees to indemnify, defend, and hold harmless the Board, its agents, officials, and employees from all claims and suits including court costs, attorney's fees, and other expenses caused by any act or omission of the Contractor and/or its subcontractors, if any, in the performance of this Contract. The Board shall not provide such indemnification to the Contractor.

DDTI Comment: The last paragraph should be changed to say "In exchange, the Board shall provide the same reciprocal indemnification to Contractor."

24. Independent Contractor; Workers' Compensation Insurance. The Contractor is performing as an independent entity under this Contract. No part of this Contract shall be construed to represent the creation of an employment, agency, partnership or joint venture agreement between the parties. Neither party will assume liability for any injury (including death) to any persons, or damage to any property, arising out of the acts or omissions of the agents, employees or subcontractors of the other party. The Contractor shall provide all necessary unemployment and workers' compensation insurance for the Contractor's employees, and shall provide the Board with a Certificate of Insurance evidencing such coverage prior to starting work under this Contract.

25. Insurance. The Contractor shall secure and keep in force during the term of this Contract the following insurance coverage, covering the Contractor for any and all claims of any nature which may in any manner arise out of or result from Contractor's performance under this Contract:

A. The Contractor and their subcontractors (if any) shall secure and keep in force during the term of this Contract the following insurance coverages (if applicable) covering the Contractor for any

and all claims of any nature which may in any manner arise out of or result from Contractor's performance under this Contract:

1. Commercial general liability, including contractual coverage, and products or completed operations coverage (if applicable), with minimum liability limits not less than \$700,000 per person and \$5,000,000 per occurrence unless additional coverage is required. The Board is to be named as an additional insured on a primary, non-contributory basis for any liability arising directly or indirectly under or in connection with this Contract.
2. Automobile liability for owned, non-owned and hired autos with minimum liability limits of \$700,000 per person and \$5,000,000 per occurrence. The Board is to be named as an additional insured on a primary, non-contributory basis.
3. Professional Liability, also known as Errors and Omissions Insurance, for those Contractors required to hold a professional license in Alabama with limits not less than \$700,000 per cause of action and \$5,000,000 per occurrence. This is coverage available to pay for liability arising out of the performance of professional or business-related duties, with coverage tailored to the needs of the specific profession. Coverage for the benefit of the Board shall continue for a period of two (2) years after the date of service provided under this Contract.
4. Fiduciary Liability would be required if the Contractor is responsible for the management and oversight of various employee benefit plans and programs such as pensions, profit-sharing and savings, among others. These contractors face potential claims for mismanagement brought by plan members. Limits should be no less than \$700,000 per cause of action and \$5,000,000 per occurrence.
5. Valuable Papers coverage, available under an Inland Marine policy, is recommended when any plans, drawings, media, data, records, reports, billings and other documents are produced or used under this agreement. Insurance must have limits sufficient to pay for the re-creation and reconstruction of such records.
6. The Contractor shall secure the appropriate Surety or Fidelity Bond(s) as required by applicable statutes.
7. The Contractor shall provide proof of such insurance coverage by tendering to the Board a certificate of insurance prior to the commencement of this Contract and proof of workers' compensation coverage meeting all statutory requirements. In addition, proof of an "all states endorsement" covering claims occurring outside Alabama is required if any of the services provided under this Contract involve work outside of Alabama.

B. The Contractor's insurance coverage must meet the following additional requirements:

1. The insurer must have a certificate of authority or other appropriate authorization to operate in the state in which the policy was issued.

2. Any deductible or self-insured retention amount or other similar obligation under the insurance policies shall be the sole obligation of the Contractor.
3. The Board will be defended, indemnified and held harmless to the full extent of any coverage actually secured by the Contractor in excess of the minimum requirements set forth above. The duty to indemnify the Board under this Contract shall not be limited by the insurance required in this Contract.
4. The insurance required in this Contract, through a policy or endorsement(s), shall include a provision that the policy and endorsements may not be canceled or modified without thirty (30) days' prior written notice to the Board.
5. The Contractor waives and agrees to require their insurer to waive their rights of subrogation against the Board.

C. Failure to provide insurance as required in this Contract may be deemed a material breach of contract entitling the Board to immediately terminate this Contract. The Contractor shall furnish a certificate of insurance and all endorsements to the Board before the commencement of this Contract.

26. Key Person(s).

A. If both parties have designated that certain individual(s) are essential to the services offered, the parties agree that should such individual(s) leave their employment during the term of this Contract for whatever reason, the Board shall have the right to terminate this Contract upon thirty (30) days' prior written notice.

B. In the event that the Contractor is an individual, that individual shall be considered a key person and, as such, essential to this Contract. Substitution of another for the Contractor shall not be permitted without express written consent of the Board.

Nothing in sections A and B, above shall be construed to prevent the Contractor from using the services of others to perform tasks ancillary to those tasks which directly require the expertise of the key person. Examples of such ancillary tasks include secretarial, clerical, and common labor duties. The Contractor shall, at all times, remain responsible for the performance of all necessary tasks, whether performed by a key person or others.

Key person(s) to this Contract is/are _____

DDTI Comment: DDTI provides NG9-1-1 software and services for multiple States and there is no one individual that is critical for the implementation of our products or services.

27. Minority, Women, and Veteran Business Enterprise Participation. Substantially all of the work under this Contract will be performed directly by the Contractor’s employees or by its certified technicians. Prior to the time the Contractor employs any third-party subcontractors, the Contractor will work with the Board to identify opportunities and select qualified participants.

28. Licensing Standards. The Contractor, its employees and subcontractors shall comply with all applicable licensing standards, certification standards, accrediting standards and any other laws, rules, or regulations governing services to be provided by the Contractor pursuant to this Contract. The Board will not pay the Contractor for any services performed when the Contractor, its employees or subcontractors are not in compliance with such applicable standards, laws, rules, or regulations. If any license, certification or accreditation expires or is revoked, or any disciplinary action is taken against an applicable license, certification, or accreditation, the Contractor shall notify the Board immediately and the Board, at its option, may immediately terminate this Contract.

29. Merger & Modification. This Contract constitutes the entire agreement between the parties. No understandings, agreements, or representations, oral or written, not specified within this Contract will be valid provisions of this Contract. This Contract may not be modified, supplemented, or amended, except by written agreement signed by all necessary parties.

30. Nondiscrimination.

Pursuant to the federal Civil Rights Act of 1964, the Age Discrimination in Employment Act, and the Americans with Disabilities Act, the Contractor covenants that it shall not discriminate against any employee or applicant for employment relating to this Contract with respect to the hire, tenure, terms, conditions or privileges of employment or any matter directly or indirectly related to employment, because of the employee’s or applicant’s race, color, national origin, religion, sex, age, disability, ancestry, status as a veteran, or any other characteristic protected by federal, state, or local law (“Protected Characteristics”). Contractor certifies compliance with applicable federal laws, regulations, and executive orders prohibiting discrimination based on the Protected Characteristics in the provision of services. Breach of this paragraph may be regarded as a material breach of this Contract, but nothing in this paragraph shall be construed to imply or establish an employment relationship between the Board and any applicant or employee of the Contractor or any subcontractor.

The Board is periodically a recipient of federal funds, and therefore, where applicable, Contractor and any subcontractors shall comply with requisite affirmative action requirements, including reporting, pursuant to 41 CFR Chapter 60, as amended, and Section 202 of Executive Order 11246.

31. Notice to Parties. Whenever any notice, statement or other communication is required under this Contract, it shall be sent by first class mail or via an established courier or delivery service to the following addresses, unless otherwise specifically advised.

A. Notices to the Board shall be sent to:

Alabama 911 Board

Attn: _____
[ADDRESS]

B. Notices to the Contractor shall be sent to: **(Include contact name and/or title, name of vendor & address)**

Payments to the Contractor shall be made via electronic funds transfer in accordance with instructions filed by the Contractor with the Board.

32. Order of Precedence; Incorporation by Reference. Any inconsistency or ambiguity in this Contract shall be resolved by giving precedence in the following order: (1) this Contract, (2) attachments prepared by the Board, (3) RFP#_____, (4) Contractor’s response to RFP#_____, and (5) attachments prepared by the Contractor. All attachments, and all documents referred to in this paragraph, are hereby incorporated fully by reference.

33. Ownership of Documents and Materials. All documents, records, programs, data, film, tape, articles, memoranda, and other materials not developed or licensed by the Contractor prior to execution of this Contract, but specifically developed under this Contract shall be considered “work for hire” and the Contractor transfers any ownership claim to the Board and all such materials will be the property of the Board. Use of these materials, other than related to contract performance by the Contractor, without the prior written consent of the Board, is prohibited. During the performance of this Contract, the Contractor shall be responsible for any loss of or damage to these materials developed for or supplied by the Board and used to develop or assist in the services provided while the materials are in the possession of the Contractor. Any loss or damage thereto shall be restored at the Contractor’s expense. The Contractor shall provide the Board full, immediate, and unrestricted access to the work product during the term of this Contract.

34. Payments. All payments shall be made 30 days in arrears by electronic funds transfer to the financial institution designated by the Contractor in writing. No payments will be made in advance of receipt of the goods or services that are the subject of this Contract.

35. Penalties/Interest/Attorney’s Fees. The Board will in good faith perform its required obligations hereunder and does not agree to pay any penalties, liquidated damages, interest or attorney’s fees, except as permitted by Alabama law.

Any liability resulting from the Board’s failure to make prompt payment shall be based solely on the amount of funding originating from the Board and shall not be based on funding from federal or other sources.

36. Progress Reports. The Contractor shall submit progress reports to the Board upon request. The progress reports shall serve the purpose of assuring the Board that work is progressing in line with the schedule, and that completion can be reasonably assured on the scheduled date.

37. Public Record. The Contractor acknowledges that the Board will not treat this Contract as containing confidential information. Use by the public of the information contained in this Contract shall not be considered an act of the Board.

38. Renewal Option. This Contract may be renewed under the same terms and conditions, subject to the approval of the Board. The term of the renewed contract may not be longer than the term of the original contract.

39. Severability. The invalidity of any section, subsection, clause or provision of this Contract shall not affect the validity of the remaining sections, subsections, clauses or provisions of this Contract.

40. Substantial Performance. This Contract shall be deemed to be substantially performed only when fully performed according to its terms and conditions and any written amendments or supplements.

41. Taxes. The Board is exempt from most state and local taxes and many federal taxes. The Board will not be responsible for any taxes levied on the Contractor as a result of this Contract.

42. Termination for Convenience. This Contract may be terminated, in whole or in part, by the Board whenever, for any reason, the Board determines that such termination is in its best interest. Termination of services shall be affected by delivery to the Contractor of a Termination Notice at least thirty (30) days prior to the termination effective date, specifying the extent to which performance of services under such termination becomes effective. The Contractor shall be compensated for services properly rendered prior to the effective date of termination. The Board will not be liable for services performed after the effective date of termination. The Contractor shall be compensated for services herein provided but in no case shall total payment made to the Contractor exceed the original contract price or shall any price increase be allowed on individual line items if canceled only in part prior to the original termination date.

43. Termination for Default.

A. With the provision of thirty (30) days' notice to the Contractor, the Board may terminate this Contract in whole or in part if the Contractor fails to:

1. Correct or cure any breach of this Contract; the time to correct or cure the breach may be extended beyond thirty (30) days if the Board determines progress is being made and the extension is agreed to by the parties;
2. Deliver the supplies or perform the services within the time specified in this Contract or any extension;
3. Make progress so as to endanger performance of this Contract; or
4. Perform any of the other provisions of this Contract.

B. If the Board terminates this Contract in whole or in part, it may acquire, under the terms and in the manner the Board considers appropriate, supplies or services similar to those terminated, and the Contractor will be liable to the Board for any excess costs for those supplies or services. However, the Contractor shall continue the work not terminated.

DDTI Comment: “and the Contractor will be liable to the Board for any excess costs for those supplies or services” should be deleted. A sentence should be added that states “In no event shall Contractor’s financial liability exceed those funds paid to Contractor as part of this Contract before the termination occurred.”

C. The Board shall pay the contract price for completed supplies delivered and services accepted. The Contractor and the Board shall agree on the amount of payment for manufacturing materials delivered and accepted and for the protection and preservation of the property. Failure to agree will be a dispute under the Disputes clause. The Board may withhold from these amounts any sum the Board determines to be necessary to protect the Board against loss because of outstanding liens or claims of former lien holders.

D. The rights and remedies of the Board in this clause are in addition to any other rights and remedies provided by law or equity or under this Contract.

44. Travel. No expenses for travel will be reimbursed unless specifically permitted under the scope of services or consideration provisions. If approved by the Board, expenditures made by the Contractor for travel will be reimbursed at the current rate paid by the Board and in accordance with the State Travel Policies and Procedures as specified in the current Financial Management Circular. Out-of-state travel requests must be reviewed by the Board for availability of funds and for appropriateness per Circular guidelines.

45. Waiver of Rights. No right conferred on either party under this Contract shall be deemed waived, and no breach of this Contract excused, unless such waiver is in writing and signed by the party claimed to have waived such right. Neither the Board’s review, approval or acceptance of, nor payment for, the services required under this Contract shall be construed to operate as a waiver of any rights under this Contract or of any cause of action arising out of the performance of this Contract, and the Contractor shall be and remain liable to the Board in accordance with applicable law for all damages to the Board caused by the Contractor’s negligent performance of any of the services furnished under this Contract.

46. Work Standards. The Contractor shall execute its responsibilities by following and applying at all times the highest professional and technical guidelines and standards. If the Board becomes dissatisfied with the work product of or the working relationship with those individuals assigned to work on this Contract, the Board may request in writing the replacement of any or all such individuals, and the Contractor shall grant such request.

Non-Collusion and Acceptance

The undersigned attests, subject to the penalties for perjury, that the undersigned is the Contractor, or that the undersigned is the properly authorized representative, agent, member or officer of the

Contractor. Further, to the undersigned's knowledge, neither the undersigned nor any other member, employee, representative, agent or officer of the Contractor, directly or indirectly, has entered into or been offered any sum of money or other consideration for the execution of this Contract other than that which appears upon the face hereof.

In Witness Whereof, Contractor and the Board have, through their duly authorized representatives, entered into this Contract. The parties, having read and understood the foregoing terms of this Contract, do by their respective signatures dated below agree to the terms thereof.

[Contractor]

Alabama Statewide 911 Board

By: _____

By: _____

Printed Name: _____

Printed Name: _____

Title: _____

Title: _____

Date: _____

Date: _____

AL-GIS-RFP-19-002 - Attachment C - Cost Proposal Template

Per Item Costs	Quantity	Unit cost	Price	Indicate Frequency (i.e. one-time, monthly, annually, etc.)	Discount eligible? (Y/N)
Software License fees or costs	4888000	0.004167	\$20,368.30	monthly	N
Base system software			\$0.00		
Customization required or proposed addressing specification			\$0.00		
Additional modules required or proposed addressing specifications			\$0.00		
3rd party software, if any, required for the operation of the system	2	25000	\$50,000.00	one-time	N
Technical and user documentation			\$0.00		
Installation/conversion/integration/transition costs	600	110	\$66,000.00	one-time	N
Training including training materials			\$0.00		
Maintenance costs			\$0.00		
Existing software upgrade/integration/training			\$0.00		
Updates to supplemental files			\$0.00		
Revisions to documentation			\$0.00		
Utilities			\$0.00		
New functionality compared to prior available functionality in the market			\$0.00		
Technical support/customer service, per year			\$0.00		
Unlimited phone technical support for the technical staff			\$0.00		

Value added costs	Quantity	Unit cost	Price	Indicate Frequency (i.e. one-time, monthly, annually, etc.)	Discount eligible? (Y/N)
Consulting - hourly rate	0	0	\$0.00		

Annual price*	Year 1	Year 2	Year 3	Year 4	Year 5
Spatial Interface	\$101,841.50	\$244,419.60	\$244,419.60	\$244,419.60	\$244,419.60
QA/QC support	\$219,960.00	\$219,960.00	\$0.00	\$0.00	\$0.00
Geodatabase management	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

**The expectation is that this will be a price based upon the number of PSAPs and will grow gradually over time to the maximum amount*

AL-GIS-RFP-19-002 ATTACHMENT B-BUSINESS PROPOSAL

Attachment B - Business Proposal

Instructions

Tab Name	Instructions
Business Proposal	Please fill in the cells shaded yellow and indicate if any attachments are included in the response to each item. Some items require a yes/no answer and an explanation if the answer is no.

AL-GIS-RFP-19-002 ATTACHMENT B - BUSINESS PROPOSAL

Respondent Name: **Digital Data Technologies, Inc.**
 Please Complete Yellow Shaded Regions

2.3.1 GENERAL (OPTIONAL)

The Respondent may use this optional section of the business proposal to introduce or summarize any information the Respondent deems relevant or important to the State's successful acquisition of the products and/or services requested in this RFP.

Enter your response below. Please indicate if attachments are included.
 Please refer to Appendix 1 - Additional Information fo AL-GIS-RFP-19-002 Attachment B - Business Proposal for DDTI's response to this section.

2.3.2 RESPONDENT'S COMPANY STRUCTURE

The legal form of the Respondent's business organization, the state in which formed (accompanied by a certificate of authority), the types of business ventures in which the organization is involved, and a chart of the organization are to be included in this section. If the organization includes more than one product division, the division responsible for the development and marketing of the requested products and/or services in the United States must be described in more detail than other components of the organization.

Enter your response below. Please indicate if attachments are included.
 Please refer to Appendix 1 - Additional Information fo AL-GIS-RFP-19-002 Attachment B - Business Proposal for DDTI's response to this section.

2.3.3 COMPANY FINANCIAL INFORMATION

This section must include the Respondent's financial statement, including an income statement and balance sheet, for each of the two most recently completed fiscal years. The financial statements must demonstrate the Respondent's financial stability. If the financial statements being provided by the Respondent are those of a parent or holding company, additional financial information should be provided for the entity/organization directly responding to this RFP.

Enter your response below. Please indicate if attachments are included.
 Please refer to Appendix 1 - Additional Information fo AL-GIS-RFP-19-002 Attachment B - Business Proposal for DDTI's response to this section.

2.3.4 INTEGRITY OF COMPANY STRUCTURE AND FINANCIAL REPORTING

This section must include a statement indicating that the CEO and/or CFO has taken personal responsibility for the thoroughness and correctness of any and all financial information supplied with this proposal. The particular areas of interest to the Board in considering corporate responsibility include the following items: separation of audit functions from corporate boards and board members, if any, the manner in which the firm assures board integrity, and the separation of audit functions and consulting services. The State of Alabama will consider the information offered in this section to determine the responsibility of the Respondent.

The Sarbanes Oxley Act of 2002, H.R. 3763, is NOT directly applicable to this procurement; however, its goals and objectives may be used as a guide in the determination of corporate responsibility for financial reports.

Enter your response below. Please indicate if attachments are included.
 DDTI's CEO and COO take personal responsibility for the thoroughness and correctness of any and all financial information supplied with this proposal. DDTI's financial records are independently reviewed by the firm's Certified Public Accountants (Payne & Company CPAs, LLC) on an annual basis.

2.3.5 CONTRACT TERMS/CLAUSES

The contract resulting from this RFP will contain both mandatory and non-mandatory clauses. Mandatory clauses are non-negotiable while non-mandatory clauses are highly desirable. **Attachment A** contains a sample contract that will be similar to the one resulting from this RFP. Please indicate your acceptance of the following mandatory/non-mandatory clauses within the sample contract. If a non-mandatory clause is not acceptable as worded, please indicate in the "Additional Contract Considerations" and suggest a specific alternative wording to address issues raised by the specific clause in the explanation space provided.

To reiterate, it's the Board's strong desire to not deviate from the contract provided in the attachment and as such the Board reserves the right to reject any and all of these requested changes. Failure to include a clear, specific, unequivocal agreement to these clauses may result in disqualification of the proposal from further evaluation.

Mandatory Clauses	Acceptance? (Yes / No)	If No, Explanation
Duties of Contractor, Rate of Pay, and Term of Contract	Yes	
Authority to Bind Contractor	Yes	
Compliance with Laws	Yes	
Drug-free Workplace Provision and Certification	Yes	
Employment Eligibility Verification	Yes	
Funding Cancellation	Yes	
Governing Laws	Yes	
Indemnification	Yes	DDTI would ask the Board to provide the same reciprocal indemnification to DDTI.
Non-discrimination Clause	Yes	
Ownership of Documents and Materials	Yes	
Payments	Yes	
Penalties/Interest/Attorney's Fees	Yes	

Termination for Convenience	Yes	
Non-collusion and Acceptance	Yes	

Additional Contract Considerations
Please note: The Board will only review or negotiate changes to contract clauses clearly identified in the transmittal letter. If there are no contract clauses identified, Respondent is considered to have accepted the clauses as they are currently written.

Enter your response below. Please indicate if attachments are included.

2.3.6 REFERENCES

The Respondent must include a list of at least three (3) clients for whom the Respondent has provided products and/or services that are the same or similar to those products and/or services requested in this RFP. Any state government for whom the Respondent has provided these products and services should be included; also to be included should be clients with locations near Alabama as site visits may be arranged. Information provided should include the name, address, and telephone number of the client facility and the name, title, and phone/fax numbers of a person who may be contacted for further information.

Reference One

Legal Name of Company or Governmental Entity
Industry of Company
Mailing Address
Telephone Number
Contact Name
Title
Telephone/Fax Number
E-mail Address
Time period in which services were provided
Please describe the service provided to this reference

Enter your response below.

State of Massachusetts State 911 Department
State Government
151 Campanelli Drive, Suite A, Middleborough, MA 02346
(508) 821-7209
Norm Fournier
Deputy Executive Director
(508) 821-7209
norm.fournier@state.ma.us
August 2013 to Present
The Commonwealth of Massachusetts was one of the first states to deploy an i3 compliant NG9-1-1 system for its 6.8 million citizens.
As a subcontractor to General Dynamic Information Systems (GDIT), DDTI worked collaboratively with MassGIS to normalize all GIS data to be used within the NG 9-1-1 system. We provided both mandatory and optional/recommended GIS datasets required for implementation and all required schemas and data structures. DDTI worked with MassGIS to develop extract, transform and load routines to populate system tables from existing datasets.
In addition, DDTI provided quality assurance and control services to include review of the following:
<ul style="list-style-type: none"> •Missing data layers •Missing attribute information •Standardization of GIS data attributes in adherence to relevant national standards •Synchronization of GIS data with MSAG and ALI •Duplicate address ranges •Direction and flow errors •Gaps and overlaps in PSAP and service boundaries and edge matching •Centerline breaks at intersections and boundaries
DDTI continues to work with MassGIS to ensure timely and accurate local input of address information and any other changes to the key datasets required for Next Generation 911 operation.
DDTI's ECRF/LVF, DataManager (SI) and LDB products are fully deployed and currently supporting NG9-1-1 operations throughout the Commonwealth.

Reference Two

Legal Name of Company or Governmental Entity
Industry of Company
Mailing Address
Telephone Number
Contact Name
Title
Telephone/Fax Number
E-mail Address

Enter your response below.

National Capital Region
16 jurisdictions in Virginia, Maryland and Washington DC.
12000 Government Center Pkwy, Suite 117, Fairfax, VA 22035
(703) 324-2981
Judy A. Doldorf, GISP
Public Safety GIS Manager
(703) 324-2981
Judy.Doldorf@fairfaxcounty.gov

Reference Three

Legal Name of Company or Governmental Entity
Industry of Company
Mailing Address
Telephone Number
Contact Name
Title
Telephone/Fax Number
E-mail Address
Time period in which services were provided
Please describe the service provided to this reference
Provide reason(s) for loss or termination

Enter your response below.

N/A

Corporate Litigation

Does your company have any pending litigation regarding contract disputes?
--

Enter your response below. Please indicate if attachments are included.

DDTI has no pending litigation regarding contract disputes.

2.3.7 REGISTRATION TO DO BUSINESS

Respondents providing the products and/or services required by this RFP must be registered and in good standing with the Alabama Secretary of State. The requirement is applicable to all limited liability partnerships, limited partnerships, corporations, S-corporations, nonprofit corporations, and limited liability companies. Please indicate the status of registration.

Registered? (Yes / No)

If No, Explanation

No

DDTI will register with the Alabama Secretary of State when and if selected as the vendor of choice for this RFP.

2.3.8 AUTHORIZING DOCUMENT

Respondent personnel signing the Transmittal Letter of the proposal must be legally authorized by the organization to commit the organization contractually. This section shall contain proof of such authority. A copy of corporate bylaws or a corporate resolution adopted by the board of directors indicating this authority will fulfill this requirement.

Enter your response below. Please indicate if attachments are included.

Please refer to Appendix 5 - Corporate Resolution.
--

2.3.9 SUBCONTRACTORS

The Respondent is responsible for the performance of any obligations that may result from this RFP, and shall not be relieved by the non-performance of any subcontractor. Any Respondent's proposal must identify all subcontractors and describe the contractual relationship between the Respondent and each subcontractor. Either a copy of the executed subcontract or a letter of agreement over the official signature of the firms involved must accompany each proposal.

Any subcontracts entered into by the Respondent must be in compliance with all State statutes, and will be subject to the provisions thereof. For each portion of the proposed products or services to be provided by a subcontractor, the technical proposal must include the identification of the functions to be provided by the subcontractor and the subcontractor's related qualifications and experience.

The combined qualifications and experience of the Respondent and any or all subcontractors will be considered in the Board's evaluation. The Respondent must furnish information to the Board as to the amount of the subcontract, the qualifications of the subcontractor for guaranteeing performance, and any other data that may be required by the State. All subcontracts held by the Respondent must be made available upon request for inspection and examination by appropriate Board officials, and such relationships must meet with the approval of the Board.

The combined qualifications and experience of the Respondent and any or all subcontractors will be considered in the Board's evaluation. The Respondent must furnish information to the Board as to the amount of the subcontract, the qualifications of the subcontractor for guaranteeing performance, and any other data that may be required by the State. All subcontracts held by the Respondent must be made available upon request for inspection and examination by appropriate Board officials, and such relationships must meet with the approval of the Board.

A. Each subcontractor's area(s) of responsibility under the proposal

B. Each subcontractor's area(s) of responsibility under the proposal

C. The anticipated dollar amount for each subcontract

D. Each subcontractor's form of organization

E. An indication from each subcontractor of a willingness to carry out their responsibilities (this assurance in no way relieves the Respondent of any responsibilities in responding to this RFP or in completing the commitments documented in this proposal)

F. The qualifications of each subcontractor for guaranteeing performance

G. Identification of the functions to be provided by the subcontractor and the subcontractor's related qualifications and experience in the technical proposal for each portion of the proposed products or services to be provided by the subcontractor

H. Any other data that may be required by the State

Enter your response below. Please indicate if attachments are included.

DDTI does not anticipate using subcontractors for this engagement.
--

2.3.10 GENERAL INFORMATION

Business Information

Legal Name of Company
Contact Name

Enter your response below.

Digital Data Technologies, Inc.
Daniel Casey

Contact Title
Contact E-mail Address
Company Mailing Address
Company City, State, Zip
Company Telephone Number
Company Fax Number
Company Website Address
Number of Employees (company)
Years of Experience
Number of U.S. Offices
Year Alabama Office Established (if applicable)
Parent Company (if applicable)
Revenues (\$MM, prior year)
Revenues (\$MM, two-years prior)
% Of Revenue from Alabama customers

Chief Business Development Officer
dcasey@ddti.net
2323 W. Fifth Ave., Suite 210
Columbus, OH 43204
(614) 429-3384
(614) 429-3385
www.ddti.net
49
21
1
N/A
N/A
\$0

	Yes / No	If No, Explanation
Does your company have a formal disaster recovery plan? If no, please provide an explanation of any alternative solution your company has to offer. If yes, please note and include as an attachment.	Yes	Please refer to Appendix 5 - Business Continuity Plan for additional information.

What is your company's technology and process for securing any Board or private information that is maintained by your company?

Enter your response below. Please indicate if attachments are included.

It is not DDTI's policy to collect or store personally identifiable, private customer information or data. We do not offer software services or products that ask for private information from users. The data our software uses is generally publicly available.

DDTI uses Microsoft Active Directory to secure sensitive data and personal information for our employees, business partners and (where applicable) customer information. We control access to sensitive IT resources through group policy and monitor our overall corporate security status in near real time through third-party software.

Physical access to our office and our server and network infrastructure is limited to system administrators and monitored by video.

DDTI will not, without written consent, copy or use such records, except to carry out contracted work, and will not transfer such records to any other party not involved in the performance of the contract pursuant to this

2.3.11 EXPERIENCE SERVING STATE GOVERNMENTS

Please provide a brief description of your company's experience in serving state governments and/or quasi-governmental accounts. Disclose each state or jurisdiction in which Respondent does business or holds contracts to provide goods or services and the nature of each such business or contract.

Enter your response below. Please indicate if attachments are included.

Please refer to Appendix 1 - Additional Information fo AL-GIS-RFP-19-002 Attachment B - Business Proposal for DDTI's response to this section.

2.3.12 EXPERIENCE SERVING SIMILAR CLIENTS

Please describe your company's experience in serving clients of a similar size to the State that also had a similar scope. Please provide specific clients and detailed examples.

Enter your response below. Please indicate if attachments are included.

Please refer to Appendix 1 - Additional Information fo AL-GIS-RFP-19-002 Attachment B - Business Proposal for DDTI's response to this section.

Table of Contents

AL-GIS-RFP-19-002 Attachment D - Technical Specifications Responses	2
1.1 Overview – Phase 1: NG911 Call Routing Platform Implementation	2
1.1 Overview – Phase 2: NG911 GIS Database Administration	2
1.2 Scope of Services	3
1.3 Specifications	8
1.4 Ownership of Data	9
1.5 GIS Map Data Aggregation.....	9
2 GIS Layer Specifications	9
2.1 Road Centerlines.....	10
2.2 Site/Structure Address Points.....	13
2.3 PSAP Boundary.....	15
2.4 Emergency Services Boundary.....	17
2.5 Provisioning Boundary	19
2.6 Street Name Alias Table.....	19
3 GIS Services	20
3.1 GIS Data Management Tools	27
3.2 GIS Normalization Services	28
3.3 GIS Managed Services.....	34
4 Project Management	35
4.1 Single Point of Contact.....	35
4.2 Project Kick-off Meeting	36
4.3 Project Planning.....	36
4.4 Project Status Reporting	37

AL-GIS-RFP-19-002 Attachment D - Technical Specifications Responses

1.1 Overview – Phase 1: NG911 Call Routing Platform Implementation

COMPLY

DDTI will receive the Authoritative PSAP Boundaries from the Alabama 911 Board and perform the necessary quality control tests to ensure these polygons are complete and have no gaps or overlaps. When published to the ECRF/LVF, this polygonal information can be used to route emergency calls based on the location of the cellular telephone caller. This process should be transparent to the PSAP since the ALI, CAD, MSAG and database management remains unchanged during this phase. Phase 2 will be able to incorporate land lines and VoIP devices into the geospatial routing process.

1.1 Overview – Phase 2: NG911 GIS Database Administration

COMPLY

Data Normalization

The first stage of Phase 2 also requires a complete GIS Data Normalization process that will involve the reconciliation of the ALI, MSAG and GIS files to develop the standardized format and data structure. Discrepancies that are identified due to errors of one of the systems (ALI, MSAG or GIS) will be reported back to the PSAP GIS manager for correction.

The second stage of Phase 2 which will provide a centralized Statewide GIS System for all PSAPs. This data will be quality controlled and published to the ECRF/LVF for geospatial routing of emergency calls and validation of Service Provider records.

The LDB, MCS, ECRF/LVF and Data Normalization process are described more fully in section **3.2 GIS, ALI, MSAG Data Synchronization**.

Location Database (LDB) and MSAG Conversion Service (MCS)

In support of the first stage of Phase 2, DDTI will provide a NENA compliant Location Database (LDB) that serves as both a legacy ALI database and as a LIS in an i3 NG9-1-1 environment. The LDB retains the current information, functionality, and interfaces of today's ALI, but also can utilize the new protocols required in an NG9-1-1 deployment. The LDB supports the protocols for legacy ALI query and ALI query service, the protocols required to obtain information for wireless calls by querying the mobile positioning center (MPC) or gateway mobile location center (GMLC), and the protocols required for i3 location information retrieval and conveyance, such as HTTP-Enabled Location Delivery (HELD) or other proprietary protocols.

To successfully replace a legacy ALI system with an LDB, a mechanism must be provided to the Service providers to update the location information in the LDB. During the transition to i3, and to aid 9-1-1 authorities gaining cooperation from the Service providers, the LDB system includes a Service Order

Input (SOI) processing function that matches existing SOI processing. This means that the Service providers do not have to change current processes to support the i3 system (DDTI provides a translation mechanism called the MSAG Conversion Service (MCS) to convert SOI records into the appropriate CLDXF format for comparison against the LVF).

The LDB provides both legacy and NG9-1-1 location interfaces. To support NG9-1-1 capable PSAP's a HELD interface is provided. To support legacy PSAPs, a legacy ALI interface is provided, and location data within the LDB is converted into legacy formats using the MSAG Conversion Service (MCS).

The HELD interface can support hundreds of queries per second. The legacy ALI interface requires the legacy CPE to maintain one or more TCP/IP connections. Each CPE instance must initiate and maintain the connection to the LDB legacy ALI interface. Each individual TCP/IP connection can handle one legacy ALI query at a time (a limitation of the legacy interface, not the LDB).

The LDB utilizes a web-based interface allowing authorized personnel access to the backend location database. From this web interface, users with the appropriate permissions can schedule reports and data extracts to be run. Key functionality of the web interface includes:

- Role based security, restricting users to what they can do and what data they can see. For example, a Service provider will only be allowed to view their location records and job reports from SOI jobs they have submitted.
- Ability to query data by telephone number and address.
- Ability to modify location records and validate the changes against the LVF in real time.
- View reports.
- Workflow for resolving data discrepancies for records that have failed LVF validation (for example, if, after review, the Service provider has determined that the location data is correct, the discrepancy can be routed to the appropriate GIS department for resolution).

A more detailed explanation of the LDB and MCS is provided in **Appendix 2 - ALI System Replacement – MSAG Conversion Service (MCS) and Location Database (LDB)**.

1.2 Scope of Services

COMPLY

DDTI understands its solutions will include the use of existing and available source data, GIS files and the coordination and management required to complete a Statewide aggregation of quality-controlled GIS data that meets NENA Standards.

1. DDTI is a fully integrated business partner with INdigital. Our software has been rigorously tested to ensure interoperability and DDTI has complete confidence in our ability to work effectively with this leading NG9-1-1 organization to transition to geospatial routing for all PSAPs.

Based on our experience, it is possible to quickly transition to geospatial routing of cellular emergency calls (typically the majority of 9-1-1 calls) with accurate PSAP polygons defined in the ECRF/LVF. As the GIS data is normalized and aggregated at a statewide level and the LDB is populated with Service Provider customer records, the remainder of emergency calls can be geospatially routed, eliminating the need for ALI services and selective routers.

2. A key objective of the project is to design, implement and maintain the Emergency Call Routing Function (ECRF) dataset as an aggregation of local data sources. This ECRF dataset should meet the accuracy requirements necessary to support the ECRF call route determination functionality in a Next Generation 9-1-1 (NG9-1-1) system. DDTI assumes the local jurisdictions (PSAPs) will have the ability to provide or develop the source GIS data required to populate the ECRF/LVF and geospatially route 9-1-1 traffic. The tasks associated with preparing GIS data includes the following:

- Provide Quality Control and Quality Assurance tests to detect errors and provide correction assistance for:
 - ALI to Centerline
 - MSAG to Centerline
 - Address Points (Site/Structure)
 - Boundary gaps and overlaps (PSAP and Emergency Service)
- Create a single Statewide NG9-1-1 dataset adhering to the NENA NG Data Model.
- Enable the implementation of a NG-GIS system, including implementation of a Spatial Interface (SI), in cooperation with the NG9-1-1 System Service Provider (SSP).
- Develop a process and workflow that will:
 - Enable PSAPs to update GIS data as needed.
 - Continuously perform QA/QC tests on submitted data to ensure accuracy.
 - Ensure updates to the ECRF/LVF are processed in a timely manner.
 - Facilitate, coordinate, and communicate resolution of conflicting geospatial datasets.
 - Allow dynamic changes to routing geospatial data.
- Maintain compliance with NENA Data Model standards NENA STA-015.10-2018 and NENA STA-006.1-2018.

In addition to providing support to assist in implementing the Board's strategy for Phased NG9-1-1 GIS database implementation identified in Section 1.1, DDTI has the experience and software to assist in the replacement of the ALI and MSAG.

Data Normalizations Tasks

Each local dataset will be reviewed and documented. The local GIS data to ECRF transformations will be designed and tested. DDTI will define the source for each of the required layers. Once this has been determined, DDTI's GIS Analyst will work with individual sources to document the layer metadata and design the specific data transformations required. Any gaps between the local data and the ECRF dataset model will be documented and reported for resolution.

Discrepancy testing and remediation is an iterative cycle of data updates, testing, and remediation. In the long term, this cycle is the core of the maintenance process and is continuous to ensure discrepancies are reviewed and corrected as necessary to maintain the proper functionality in the Next Generation system. DDTI will support the client as necessary to facilitate the data discrepancy resolution.

For each local GIS dataset, the MSAG/ALI/GIS data will have been tested for synchronization, individual layers tested for consistency and GIS layers tested for cross-consistency. Finally, all layers and fields will then be transformed into the statewide schema.

The polygon layers will be tested for any gaps or overlaps in the statewide coverage. Gaps and overlaps that fall outside of the predefined tolerance will be reported back to each local data source for resolution. Each local data source will be able to see the gap/overlap by adding the map layer to their local GIS editing environment to resolve the issue. Individual agencies should come to an agreement about their polygon borders and who will submit shared roads on borders to resolve any issues there are with the conflation of their two data sets. Once the revisions have been made the data sets can be resubmitted.

Roads need to be “geocodable” so the correct polygon is identified and call routing information can be determined. Proper road segmentation may be a requirement that is outside of the ECRF for the State and needs to be enforced for other reasons. Typically, road segmentation is not completely checked for ECRF data publishing in the NG 9-1-1 environment, but the data can be used for other purposes and may require proper segmentation. The roads are tested for duplication, or if the road network is not intersected properly at the jurisdictional boundaries. The addresses are tested to see if there are any duplicated addresses. In addition, all the other DataManager QCs are evaluated for the statewide data set to ensure that no transformational errors were introduced.

3. The functionality included in the DataManager Spatial Interface consists of Data Submission, Data Quality Control, Data Distribution and Administrative Control.

Data Submission

Data editing will be done within the local GIS environment and the data being edited will reside on the local system. The data will be submitted periodically by the local entity to the DataManager system via Secure File Transfer Protocol (SFTP). The DataManager system will process the data for changes, apply basic QC checks and any necessary transformations, and incorporate updates into the core database. The QC results and reports will be distributed back to the local entity.

Data Quality Control

DataManager includes a quality control (QC) process that runs continuously and evaluates updates in near real time as they are incorporated into the core database. The output of these checks is one or more (depending on the QC checks that are used) QC error layers in the DataManager system.

Users can view QC error layers using the DataManager user interface and the QC error layers can also be exported to file-based formats. Because user submission happens immediately, QC errors are visible in near real time. This immediate feedback mechanism promotes continuous improvement in the GIS editing environment. The QC checks can be assigned to several different classifications: geocoding, standards, internal consistencies, and external consistencies (if any).

Data Distribution

The Data Distribution function transforms, formats, and exports the data from the core database into files or other databases based on the client's needs. The publishing of the data can be restricted based upon errors detected during the QC process. Individual QCs are assigned to a customizable severity level, and individual thresholds can be configured for each severity level and GIS layer. These thresholds can be based on either the absolute count of errors or the relative rate of errors in the layer. If any of the QC error thresholds are violated, the publish process will be blocked. It is also possible for an administrator to configure a given publishing task to ignore the QC error thresholds, if needed.

The data distribution tasks can be initiated on demand, scheduled as a one-time publish, scheduled as a reoccurring publish, or can be triggered automatically by any changes following the completion of QC checks.

A database layer can be setup to be published to multiple user defined export files. Each one of these exports can be customized in a limited way. The specific fields to export can be designated, and the output field name and format can be configured.

Administrative Control

A website provides a secure administrative interface. Administrators can configure quality control and data publishing from the website. Administrators can also control users, permissions, and display options.

In addition to standard health and monitoring of the NG9-1-1 functional elements, there are several outputs from the system that are useful for administrative purposes. Publishing failures (due to excessive QC errors, for example) can be configured to generate email notifications. Change report summaries and counts are available on a scheduled basis, QC error summary counts are available via the DataManager user interface, as well as detailed counts by error type/description.

4. The optional Location Database (LDB) will retain the current information, functionality, and interfaces of today's ALI, but also can use the new protocols required in an NG9-1-1 deployment. The LDB supports the protocols for legacy ALI query, the protocols required to obtain information for wireless/VoIP calls by querying the mobile positioning center ("MPC") or VoIP positioning center ("VPC"), and the protocols required for i3 location information retrieval and conveyance, specifically the HELD protocol.

The LDB delivers the following capabilities:

- Supports all relevant sections of NENA 02-010, 02-011, 02-015, 04-005, 08-501, and 08-502 related to ALI DBMS.
- Capable of assuming the role of a location database as defined in the NENA NG9-1-1 Transition Plan Considerations (NENA INF 008.2-2013).
- Supports NENA standards (such as E2, E2+, NCAS, CAS).
- Provides location server functionality and interfaces as defined in NENA-STA-010.2-2016.
- Seamlessly interacts with a NENA i3 ECRF/LVF for location validation, as described in NENA-STA-010.2-2016.
- Provides location by value or by reference, as defined in NENA-STA-010.2-2016.
- Able to dereference requests for additional information, as defined in NENA-STA-010.2-2016.
- Interfaces simultaneously with multiple wireless callers.
- Interfaces simultaneously with multiple remote MPC/VPC databases.
- Automatically detects, imports and validates customer records (SOI records).
- Converts legacy MSAG style addresses using an MSAG Conversion Service (MCS) as defined in NENA-STA-010.2-2016. Civic address data stored in the LDB database must conform to all PIDF-LO and CLDXF standards.
- Dynamically converts MSAG style address received over E2 using the MSAG Conversion Service so these calls can be routed using the ECRF which must contain CLDXF compliant data.
- Natively supports all CLDXF fields for each civic address stored, including ALL of the street name elements (PRM, PRD, STP, STPS, RD, STS, POD, POM) and ALL of the address number and sub address elements (HNP, HNO, HNS, BLD, LOC, FLR, UNIT, ROOM, SEAT).
- Provides Service Providers with the ability to update their location records using their existing processes (such as SOI), or a web-based user interface.
- Provides a legacy MSAG for Service Providers that still require it. To ensure that records in this MSAG will be valid after MCS conversion to CLDXF and LVF validation, it must be generated from the inverse operation (i.e., taking all the CLDXF GIS road centerline records and converting them back into legacy format using the MCS).

- Able to be used simultaneously by both NG9-1-1-capable and E9-1-1-capable PSAPs. For E9-1-1 PSAPs, a legacy ALI service must be provided, with address data being converted from the LDB CLDXF compliant data into legacy MSAG style data using the MCS. NG9-1-1 PSAPs will utilize the HELD interface.
- Allows different E9-1-1 PSAPs to use different ALI formats based on individual needs.
- Uses LVFs to validate civic addresses using CLDXF compliant PIDF-LO.
- Supports location data formatting as defined in the NENA CLDXF.
- Periodically reevaluates the location information using LVF functions within the system.
- Communicates with NG9-1-1 functional elements using the HELD protocol.
- Provides a PIDF-LO based on both the wireless and VoIP E2 response. Wireless phase 2 should be represented with a circle in the PIDF-LO.
- Able to dereference additional data requests.
- Consistently responds to all requests within 400 ms for data that is contained within the LDB.
- Provides Service Providers and GIS Users with the necessary workflows to correct civic address records that fail validation.
- Records all NRF conditions and provide a workflow for Service Providers for corrections. The system should query the NPAC database to determine ownership of the NRF TN and automatically assign the error to the owning Service Provider.
- Supports the transition of existing PS/ALI customers to the LDB.
- Provides a web interface allowing Service Providers or other authorized users to add additional data to each record as defined in IETF RFC 7852. At a minimum, an authorized user must be able to add, edit or delete additional data blocks for a record. Supported additional data blocks must include:
 - Data Provider Information
 - Service Information
 - Device Information
 - Owner/Subscriber Information
 - Comments
- The HELD interface must support the delivery of additional data as defined in IETF RFC 7852.
- All changes to customer records in the LDB must include a full historical change history.

Additional information regarding the LDB is presented in **Appendix 2 – ALI System Replacement – MSAG Conversion Service (MCS) and Location Database (LDB)**.

1.3 Specifications

COMPLY

DDTI has responded COMPLY, NOT COMPLY or ALTERNATE to the specifications defined in this RFP. Detailed responses immediately following each specification.

DDTI's responses to this Request for Proposal (including appendices, diagrams, tables, attachments or similar documents) is under the 200-page limit specified.

1.4 Ownership of Data

COMPLY

All data and information provided and collected in conjunction with the project will not, without written consent, be copied or used except to carry out contracted work and will be returned to the State upon completion of the project (where applicable). No records will be transferred to any other party not involved in the performance of the contract pursuant to this RFP.

DDTI uses Microsoft Active Directory to secure sensitive data and personal information for our employees, business partners and (where applicable) customer information. We control access to sensitive IT resources through group policy and monitor our overall corporate security status in near real time through third-party software.

Physical access to our office and our server and network infrastructure is limited to system administrators and monitored by a security system and video.

1.5 GIS Map Data Aggregation

COMPLY

All GIS data layers aggregated for this project will be maintained as feature classes in an Environmental Systems Research Institute's (ESRI) file geodatabase in a WGS 84 Latitude/Longitude projection prior to provisioning and loading the data into the ECRF/LVF system.

DDTI's geodatabase model complies with the NENA GIS Data Model (NENA STA-015.10-2018 and NENA STA-006.1-2018). The GIS data layers, and their associated attribute data, represents the GIS map data to be aggregated and provisioned for the ECRF/LVF functions within the NG9-1-1 system.

DDTI will aggregate the specified GIS data layers and their representative attributes into a seamless Statewide dataset. The basis of this aggregated dataset will come from a combination of available source data from local PSAPs, County and Municipal governments, Alabama State agencies, and other applicable data sources.

2 GIS Layer Specifications

COMPLY

Each of the layers defined are required to be aggregated into a statewide layer and requires adherence to the NENA NG9-1-1 GIS Data Model standard. Each source layer will be evaluated and compared for completeness and compliance to the standard. The data owners will be provided a gap analysis based on the comparison between the local model and the standard. Once the source data structure/schema has met the standard, quality control will be performed at the individual layer level and quality control across the datasets. Where possible, each error will be reported using X and Y locations to aid in

remediation by placing the error location on a map. Each error will be distributed to the authority designated to resolve the discrepancy. Each layer will be evaluated at a local level and a statewide level.

After local datasets meet the NG9-1-1 structure they will be combined into one statewide dataset. Disparate coordinate systems may be used among local PSAP datasets and this will be evaluated so a seamless WGS84 dataset will be the final product. When the coordinate systems and schemas are in alignment, the datasets will be merged together to form a statewide dataset. QC will take place to identify topology errors in the dataset (e.g., no gaps or overlaps in the boundary data, roads broken at boundaries, roads broken at intersections, etc.) and those errors will be provided to the agency responsible for remediation. Topology rules are enforced at both the local dataset level and at a statewide level. When all levels of QC and synchronization have been achieved to the agreed upon levels, the data will be considered suitable for NG9-1-1 spatial call routing.

2.1 Road Centerlines

COMPLY

Road segmentation, topology, and other thematic GIS rules may be required as business rules for some applications, but they are not totally necessary for ECRF operations. DDTI will assume that segmentation requirements for the road network are necessary for downstream purposes such as CAD, RMS, PSAP display, and/or other elements. A good phased approach would consider a short-term and long-term acceptance of a fully compliant NENA STA-006 dataset. During the transition, the short-term acceptance would require only the data structure and content necessary to support Selective Router data, and long term to meet the Data Contents required for end-state geospatial call routing.

Street name elements will be examined, and the roads must be segmented any time the street name elements change. The actual street name elements will be associated with MSAG data sources to verify that they agree. These techniques are database related and are outlined in the synchronization routines. The Address Points and Road Centerlines have a strong relationship when it comes to addressing as well as relationship between the segments and polygons which determines certain road centerline attributes and defines additional locations where the road network must be segmented. The spatial relationship will determine the Left and Right attributes for the road.

The address ranges for segments with the same set of street naming fields cannot have overlapping address ranges. The left and right ranges for a segment cannot overlap (including overlapping parity). These errors can cause a prospective landline call to have multiple possible locations. Address range fields shall not be in character format but rather be in numeric format with no special characters.

The community field will be analyzed to see if unique entries or misspellings exist which may be inconsistent for data comparisons. The road network will then be spatially analyzed for duplicate geometry, invalid geometry, road direction (NENA 02-014 section 4.3.5) and overpass underpass situations where crossing geometry shall not intersect.

2.1.1 Layer Specifications

In NG9-1-1 the Road Centerline geometry and attribution are used for location determination and/or validation. In a phased approach, the first goal would be ensuring that the Road Centerlines have adequate and equal information that the legacy MSAG contains so landline calls can continue to be accurately routed to the correct PSAP. Longer term goals would be support of downstream functional elements using the same GIS data (e.g., Mapping Data Services, CAD, etc.) which will require further information gathering on additional uses, further attribute development, and oversight to continue the consistent maintenance processes for all data submitters.

The road centerline layer will be evaluated on naming, address range, and community fields. It is recommended that the legacy naming rules adhere to NENA 71-501 with conformance to USPS Publication No. 28 – Appendix C1 naming. Special attention to punctuation and format of street spellings (1st vs. First) will be noted. State jurisdiction roadways and other primary carrier roadway naming will also be noted for future reference as they may require modification. The data must have clear and consistent street naming fields including a designated Left/Right area. The Street Name field must be populated for each record. If these fields are not correctly populated then some civic addresses may not be located, hence the call will not be properly routed. The address ranges must correspond to the geometry of the polylines (polylines have a direction hence the ranges must match the From and To nodes of the geometry) and this type of error will cause the location estimate for the civic address to be poorly estimated. It is possible that it will fall into the incorrect Service Boundary polygon and cause the call to be misrouted. The address ranges for segments with the same set of street naming fields cannot have overlapping address ranges. The left and right ranges for a segment cannot overlap (including overlapping parity). These errors can cause a prospective landline call to have multiple possible locations. Address range fields shall not be in character format but rather be in numeric format with no special characters. Finally, the community field will be analyzed to see if unique entries or misspellings exist which may be inconsistent for data comparisons. The road network will then be spatially analyzed for the following: Duplicate geometry, invalid geometry, road direction (NENA 02-014 section 4.3.5), and overpass underpass situations where crossing geometry shall not intersect.

The following specifications will be applied:

- Adherence to the NENA NENA-STA-006.1-2018 standards.
- All road centerline segments shall be broken at:
 - ESB, ESN, unincorporated town, municipal, PSAP, County and State boundaries
 - All road centerline intersections except for overpasses
 - At any change in primary street name
- A local 911 Authority may decide to break road centerlines in other instances at its discretion, however, unless there's a rational reason for breaking a line segment then no breaks will exist except at dead-ends or in the instances stated above.
- Road centerlines must not overlap except overpasses and must not have dangles except for dead ends.

- Address attributes will be compatible with the direction of digitizing for addressable road centerlines.
- Invalid dangle nodes shall be corrected.
- DDTI will identify all errors and discrepancies identified during the aggregation of this data layer and submit the identified errors and discrepancies to the local entity for remediation.

The following quality control tests will be conducted:

QC Test	Description	Type
NENA mandatory field not populated	At least one of the NENA mandatory fields is not populated	Internal Layer Test
Repeated Geometry	Segments that have duplicate geometry (including inversed duplicates)	Internal Layer Test
Invalid Suffix	NENA Standard	Internal Layer Test
Invalid Prefix	NENA Standard	Internal Layer Test
Invalid Street Type	NENA Standard	Internal Layer Test
Address Range Value too Large	NENA Standard	Internal Layer Test
Empty Street Name	Segments should have the Street Name field populated	Internal Layer Test
Null Geometry	Database record with no geometry	Internal Layer Test
Invalid Geometry	Geometry is not valid	Internal Layer Test
Address Range Overlap	2 or more segments with the same name fields and overlapping address ranges	Internal Layer Test
Address Range Gaps	The segments that make up a given street have an address range gap	Internal Layer Test
Address Range Parity	The address ranges have mixed parities on the same side.	Internal Layer Test
Zero Address Ranges	This is a warning that the segment has zero in at least one of the 4 address range fields.	Internal Layer Test
Decreasing Address Range	Optional: At least one side has the TO Address less than the FROM address. This is also dependent on the geometry of the segment.	Internal Layer Test
Centerlines not Intersected	Road Centerlines are not intersected at a physical intersection	Internal Layer Test
Conflicting Centerline Direction	The segments that make up a road do not have a consistent direction for the geometry	Internal Layer Test
Dangling Nodes	Dangling nodes within the Right of Way i.e. Dangling nodes within 30 feet of another segment (Configurable)	Internal Layer Test
Jagged Road Centerline	The segment has an interior sequence of vertices that generate large changes in the direction of the segment. These are usually due to digitization errors.	Internal Layer Test

QC Test	Description	Type
Segment Length	The segment length is lower than a configurable tolerance.	Internal Layer Test
Address Range does not Match Address Points	The address ranges do not reflect the address points: parity, address flow, etc.	Multi-Layer Test
Segment is not contained within one Emergency Service Boundary	Segment is either in more than one polygon or is not contained by any polygon	Multi-Layer Test
Segment is not contained within one Political Jurisdiction Boundary	Segment is either in more than one polygon or is not contained by any polygon	Multi-Layer Test
Segment does not have at least one MSAG Name Match	The Road Centerline does not have a matching MSAG record when comparing the Street Name fields and Community field	MSAG Test
MSAG record does not have at least one segment with a Name Match	The MSAG record does not have a matching Road Centerline record when comparing the Street Name fields and Community field.	MSAG Test
A valid MSAG Address does not have a unique Road Centerline segment match	For every valid MSAG address, find a unique Road Centerline segment that matches the Street Name fields, Community and is contained within the Address Ranges.	MSAG Test (Optional)
A Valid Centerline Address does not have a unique MSAG record Match	For every valid Road Centerline address, find a unique MSAG record that matches the Street Name fields, Community, and MSAG Address Range.	MSAG Test (Optional)
A valid ALI address record does not have a unique Road Centerline segment Match	For every valid ALI address	ALI Test
A segment that is common to more than one Local Entity does not have matching geometry	These are Road Centerline segments that are on the boundary of two Local Entities.	Global Topology Test
A segment that intersects with another segment from a different Local Entity does not intersect.	These are Road Centerline segments that should intersect at the boundary of two Local Entities.	Global Topology Test

2.2 Site/Structure Address Points

For geospatial call routing to work most effectively, the address points used in the ECRF should represent locations to the finest degree necessary to determine unambiguous locations with full LVF validation. Address points will be created and reviewed to support the ECRF.

While not strictly a topology issue, many addressing schemes will address even house numbers to one side of the road with odd house numbers on the other side. Some care will need to be taken with data to reflect these addressing schemes and use address locations to represent real world issues with addressing that have complicated topology For geocoding to work properly, the address ranges on the roads must reflect the spatial relationship between the polylines and the addresses. Polyline are typically stored as an ordered list of vertices. This means that the GIS

representation of the roads has a definite direction spatially. This direction determines the “Left” and “Right” sides of the road for address ranges. Furthermore, the direction of the centerline determines the “From” and “To” address ranges where “From” is associated to the spatial beginning of the road and the “To” is associated with the end of the polyline.

2.2.1 Layer Specifications

- Adherence to the NENA NG9-1-1 GIS Data Model standards.
- DDTI will specify all errors and discrepancies identified during the aggregation of this data layer and submit the identified errors and discrepancies to the local entity for remediation.

The following quality control tests will be conducted:

QC Test	Description	Type
NENA mandatory field not populated	At least one of the NENA mandatory fields is not populated	Internal Layer Test
Repeated Geometry	Points that have duplicate geometry (including inversed duplicates)	Internal Layer Test
Invalid Suffix	NENA Standard	Internal Layer Test
Invalid Prefix	NENA Standard	Internal Layer Test
Invalid Street Type	NENA Standard	Internal Layer Test
Address House Number Value too Large	NENA Standard	Internal Layer Test
Empty Street Name	Segments should have the Street Name field populated	Internal Layer Test
Null Geometry	Database record with no geometry	Internal Layer Test
Invalid Geometry	Geometry is not valid	Internal Layer Test
Address value is not unique	There is more than one address record with the same address value	Internal Layer Test
Address does not have a matching Road Segment	There are no Road Segments where the Street Name fields, Community match and the address falls within the Address Range of the segment.	Multi-Layer Test
Address parity does not match Road Centerline segment	The Address parity does not the side parity of the Road Centerline segment.	Multi-Layer Test
Address is too far from matching Road Centerline segment	Optional: configurable distance	Multi-Layer Test
Address House Number does not fit into matching Road Centerline segment	The house number is not contained in the appropriate Address Range	Multi-Layer Test
Address sequence error	Compared to neighboring addresses (on the same side) the house number is out of order	Multi-Layer Test
Address side	Optional: The Address record side attribute does not match the geometric side (compared	Multi-Layer Test

QC Test	Description	Type
	to the Road Centerline segment)	
Address not contained in a Emergency Service polygon	The Address record is not contained in any Emergency Service polygon	Multi-Layer Test
Address on an Emergency Service polygon boundary	The Address record falls directly on an Emergency Service boundary	Multi-Layer Test
Address is not contained in County Boundary	Optional: If County layer is provided	Multi-Layer Test
Address on a Country polygon boundary	Optional: If County layer is provided	Multi-Layer Test
A valid Address record does not have a unique MSAG Match	There are zero or more than one MSAG records that have matching Street Name fields, Community, and the house number is contained in the MSAG Address Range.	MSAG Test
A valid ALI address record does not have a unique matching Address Point record.	There are zero or more than one Address Point records that match the ALI record using the Street Name fields, Community, House Number, etc.	ALI Test

2.3 PSAP Boundary

COMPLY

Authoritative call routing responses from the ECRF/LVF are determined by service boundaries provisioned as part of the GIS data. These service boundaries must be attributed with certain minimum information as documented by the NENA GIS data model. The default configuration of the ECRF/LVF supports the use of all services documented in RFC 5031, including those corresponding to boundaries for PSAPs (sos), police, fire, and EMS. Additional services, and their corresponding boundaries, may be configured and provisioned to the ECRF/LVF as needed, with no predefined limit.

The extents of the geographic coverage area for PSAP services should be carefully composed and with appropriate human knowledge and coordination between neighboring PSAP agencies. Once aggregated the boundary file will be analyzed for spatial integrity identifying multi-polygons, gaps, and overlaps. These boundaries are then compared to the road centerlines for topology comparison. Unique boundary attributes indicate suggested road topology changes so that the Road Centerlines can accurately reflect these attributes. The SIP URIs must be valid and working URIs for the ESInet call handling equipment.

RFC 5222 specifies that “mandatory-to-implement” baseline profiles include both civic and geodetic locations. The ECRF/LVF fully supports queries using either of these profiles, including all shapes defined for use therein.

Authoritative call routing responses from the ECRF/LVF are determined by the service boundaries provisioned as part of the GIS data. When a query uses a geodetic location, the response is determined via a straightforward comparison with the service boundary polygons for the requested service and suitable substitute services.

When a civic location is used in a query, the ECRF/LVF first attempts to match the location to a known GIS feature, or set of features, and then compares the geometric representation of those features with the service polygons in a similar fashion to geodetic query processing described above.

The LoST <findService> request, defined in RFC 5222, includes a required <service> element that indicates what service the query is asking about. Typically, service boundaries are maintained in the GIS data as separate layers corresponding to each service (police, fire, EMS, etc.).

When formulating a LoST response, the ECRF/LVF first considers boundaries originating from the layer corresponding to the service provided in the request. If a request is made for a service which does not have a boundary matching the requested location, the ECRF/LVF will consider suitable substitute service boundaries (which originate from other layers). The service substitution mechanism is defined in RFC 5222, and the determination of suitable substitutes is configurable in the ECRF/LVF.

For civic queries, the ECRF/LVF has the capability to use addresses or road centerlines to answer the query. There is no mechanism defined in LoST to associate a civic query with a particular GIS reference layer, and the choice of which layer(s) to use rests solely with the ECRF/LVF. The DDTI ECRF/LVF provides extended information in the response, as permitted by the LoST XML schema, that indicates which layer was used to match the location in the query.

2.3.1 Layer Specifications

DDTI will adhere to the NENA NG9-1-1 GIS Data Model Standards and each source layer will be evaluated and compared for completeness and compliance to the standard. The data owners will be provided a gap analysis based on the comparison between the local model and the standard. Once the source data structure/schema has met the standard, quality control will be performed at the individual layer level and quality control across the datasets. Where possible, each error will be reported using X and Y locations to aid in remediation by placing the error location on a map. Each error will be distributed to the authority designated to resolve the discrepancy. Each layer will be evaluated at a local level and a statewide level.

When the coordinate systems and schemas are in alignment, the datasets will be merged together to form a statewide dataset. QCs will take place to identify topology errors in the dataset (e.g., no gaps or overlaps in the boundary data, roads broken at boundaries, roads broken at intersections, etc.) and those errors will be provided to the agency responsible for remediation. Topology rules are enforced at both the local dataset level and at a statewide level. When all levels of QC and synchronization have been achieved to the agreed upon levels, the data will be considered suitable for NG9-1-1 spatial call routing.

2.4 Emergency Services Boundary

COMPLY

An emergency service boundary layer defines the primary geographic area of law enforcement, EMS, and fire responders. Each emergency service boundary layer may contain one or more polygon boundaries that define the primary emergency services for that geographic area. There must be a separate emergency service boundary layer for each type of service discipline. Each individual layer for the identified responder disciplines is used by the ECRF to perform a geographic query that determines which responding agencies are responsible for providing emergency services for the location of a 911 caller.

Authoritative call routing responses from the ECRF/LVF are determined by service boundaries provisioned as part of the GIS data. These service boundaries must be attributed with certain minimum information as documented by the NENA GIS data model. The default configuration of the ECRF/LVF supports the use of all services documented in RFC 5031, including those corresponding to boundaries for PSAPs (sos), police, fire, and EMS. Additional services, and their corresponding boundaries, may be configured and provisioned to the ECRF/LVF as needed, with no predefined limit. At a minimum, there will be a separate ESB layer for Law Enforcement, Fire and Emergency Medical Services.

RFC 5222 specifies that “mandatory-to-implement” baseline profiles include both civic and geodetic locations. The ECRF/LVF fully supports queries using either of these profiles, including all shapes defined for use therein.

Authoritative call routing responses from the ECRF/LVF are determined by the service boundaries provisioned as part of the GIS data. When a query uses a geodetic location, the response is determined via a straightforward comparison with the service boundary polygons for the requested service and suitable substitute services.

When a civic location is used in a query, the ECRF/LVF first attempts to match the location to a known GIS feature, or set of features, and then compares the geometric representation of those features with the service polygons in a similar fashion to geodetic query processing described above.

The LoST <findService> request, defined in RFC 5222, includes a required <service> element that indicates what service the query is asking about. Typically, service boundaries are maintained in the GIS data as separate layers corresponding to each service (police, fire, EMS, etc.).

When formulating a LoST response, the ECRF/LVF first considers boundaries originating from the layer corresponding to the service provided in the request. If a request is made for a service which does not have a boundary matching the requested location, the ECRF/LVF will consider suitable substitute service boundaries (which originate from other layers). The service substitution mechanism is defined in RFC 5222, and the determination of suitable substitutes is configurable in the ECRF/LVF.

For civic queries, the ECRF/LVF has the capability to use addresses or road centerlines to answer the query. There is no mechanism defined in LoST to associate a civic query with a particular GIS reference layer, and the choice of which layer(s) to use rests solely with the ECRF/LVF.

2.4.1 Layer Specifications

DDTI will adhere to the NENA NG9-1-1 GIS Data Model Standards and each source layer will be evaluated and compared for completeness and compliance to the standard. The data owners will be provided a gap analysis based on the comparison between the local model and the standard. Once the source data structure/schema has met the standard, quality control will be performed at the individual layer level and quality control across the datasets. Where possible, each error will be reported using X and Y locations to aid in remediation by placing the error location on a map. Each error will be distributed to the authority designated to resolve the discrepancy. Each layer will be evaluated at a local level and a statewide level.

When the coordinate systems and schemas are in alignment, the datasets will be merged together to form a statewide dataset. QCs will take place to identify topology errors in the dataset (e.g., no gaps or overlaps in the boundary data, roads broken at boundaries, roads broken at intersections, etc.) and those errors will be provided to the agency responsible for remediation. Topology rules are enforced at both the local dataset level and at a statewide level. When all levels of QC and synchronization have been achieved to the agreed upon levels, the data will be considered suitable for NG9-1-1 spatial call routing.

The following quality control tests will be conducted:

QC Test	Description	Type
NENA mandatory field not populated	At least one of the NENA mandatory fields is not populated	Internal Layer Test
Gap in Polygons	The polygon layer has a gap.	Internal Layer Test
Overlap in Polygons	The polygon layer has an overlap	Internal Layer Test
Layer does not cover the designated area	The polygon layer does not cover its designated area of coverage	Internal Layer Test
Agency Name	The Agency Name for the polygon does not match one of the Agencies in the Valid Agency list.	Internal Layer Test
URI	URI is not valid	Internal Layer Test
URN	URN is not valid	Internal Layer Test
Gap in Polygons	There is a gap in the set of all polygons	Global Topology Test
Overlap in Polygons	There is an overlap in the set of all polygons	Global Topology Test

2.5 Provisioning Boundary

COMPLY

A Provisioning Boundary in NG9-1-1 is meant to act as a spatial boundary layer for the SI, or other QC mechanism, to compare against the submitted ECRF GIS data to determine if any of ECRF GIS data falls spatially outside the Provisioning Boundary. If this occurs, a submitter of GIS data will be notified that they are trying to provision data to the ECRF to an area that they are not authoritative for. If this error occurs the Provisioning Boundary must be adjusted or ECRF GIS data adjusted to bring the two into alignment before data reaches the ECRF and LVF. Although the Provisioning Boundary is not a layer that is used during call routing, it is an important layer for preparing and provisioning appropriate data for the ECRF and LVF.

Creation of this layer will be determined based on authoritative data used for the ECRF and LVF and who is the designated the authority for each area and each layer. Identifying data ownership and maintenance for each layer used is crucial to this layer's successful implementation. When a National Forest Guide is implemented and can consume this layer, then a seamless boundary will be available to the Forest Guide services.

2.5.1 Layer Specifications

Per NENA-STA-006.1-2018, this polygon layer defines the area of GIS data provisioning responsibility, with no unintentional gaps or overlaps. The Provisioning Boundary must be agreed to by all adjoining data provisioning providers. This Provisioning Boundary layer can be used by an ECRF to facilitate exclusion of erroneous features that lie beyond the boundary, for geoprocessing purposes and can also be used by the Forest Guide to determine coverage for a data provisioning authority.

There shall be no unintentional gaps or overlaps within a Provisioning Boundary or between a 911 Authority's Provisioning Boundary and the Provisioning Boundaries of other neighboring 911 Authorities.

2.6 Street Name Alias Table

COMPLY

Each Local Entity will provide a Street Name Alias Table data set (if available). The data will be assessed and tested to ensure compliance to the NENA standards and other requirements as set forth by the state of Alabama. Once the data has been aggregated, our quality control processes provide another test to ensure global consistency.

All QC reports will be made available to the local entity and, where possible, DDTI will assist with the correction(s). After corrections have been made, the data will go through another QC phase and the process will be repeated until the data meets the designated requirements.

A good phased approach would be ideal in the case of the Street Name Alias Table since it is not a required NENA layer. To implement successfully, it is important to understand how the table is intended to be used in a deployment. The Street Name Alias Table should only be considered and used to solve locations that cannot be supported by either Address Locations or where local business rules do not allow for multiple geometries in one location. Moving toward end-state NG9-1-1, the alias data will have more impact and relevance in a call taker display or PSAP mapping where the user can search for locations with variable naming to identify a specific location. Address range overlaps are common, and problematic when a Street Name Alias Table is introduced under the current NENA standards since there are no alias ranges for segments. To solve for these cases, the standard must be expanded, or road centerlines must be added.

2.6.1 Layer Specifications

The parsing of street name elements will follow the CLDXF standard.

The following quality control tests will be conducted:

QC Test	Description	Type
NENA mandatory field not populated	At least one of the NENA mandatory fields is not populated	Internal Layer Test
Street Name Fields NENA Compliant	The Road Name Alias record meets requirements for the Street Name fields.	Internal Layer Test
RCL_Unique_ID Exists	There exists a Road Centerline record that has a matching RCL_Unique_ID.	Multi-Layer Test

3 GIS Services

COMPLY

DDTI DataManager (SI) Overview

At the heart of the GIS to ECRF/LVF integration is the DDTI DataManager solution. This function acts as the Spatial Interface (SI) and supports the periodic loading of GIS data from external systems.

GIS data in an Esri compatible format can be uploaded to the DataManager via a Secure File Transfer Protocol (SFTP). The data is verified to be in the proper schema and loaded into the SI. Once the data load is complete, DataManager performs numerous quality control checks on the data. The resulting QC errors can be viewed directly using any software capable of consuming Esri-based web services. This will allow the viewing of any map data discrepancies in real-time. Following the QC process, if the number and severity of any errors are within configurable limits, DataManager will make updated data available to the master ECRF/LVF database.

Additional publishing routines can be set-up for other applications that may need GIS data. This allows administrators to create publishing tasks to export copies of the data into a format that is required by third-party applications.

The DataManager product generally allows each GIS authority to keep their GIS data in their existing schema, minimizing any impact on existing workflows and processes. If a county GIS dataset is missing critical data required in the ECRF/LVF, DDTI will work with each GIS authority to develop a solution.

Each jurisdiction will have its own set of layers within DataManager. In addition, there will be an aggregated state-wide dataset. When changes occur to a jurisdiction GIS layer, and those changes pass the quality control checks, those changes will be pushed to the aggregated state-wide dataset, where additional quality control checks will run (something might not be an error at the local dataset level but could be an error at the aggregated dataset level, such as a duplicate address).

Data Import

DataManager supports the loading of GIS data from external systems. Local jurisdictions will provide an export product from their database to a SFTP site on a regular basis. Once the data is placed on the SFTP, automated processes will move the data into the drop folder for the DataManager.

The Data Import Service will test new GIS data to ensure required fields are complete prior to loading. The following screenshot shows an email report for a successful load of new GIS data into the system (at this stage, nothing has been published to the ECRF/LVF).

```
Results for Spatial Data Import to Mass: ██████████

Import Layer: Address_Points -> Addresses (SkipOnError=True, AllowMultiGeometry=False, BlankOutUnmappedFields=False, PartialDatasetDetection=True (diff of 10% or 300000 records triggers partial), AliasRecordsCheck=False (ExpectedCount=-1, DeviationPercent=-1), CommitFrequency=1000, DataTable=False, ChangeReport=False (ReportName=ChangeReport, ChangeTypes=AMD, NewPrefix=NEW_, OldPrefix=OLD_, EmailReport=False, ReportDir=), 26 fields).
Source file: 'D:\DDTI\Data Import Server\ Drops\FDB\MassAddresses\EXPORT_PRODUCT.gdb [Address_Points], ID=131693296691009529'.

Target validation SUCCEEDED
Source validation SUCCEEDED

+++++ IMPORT STARTED
3382642 source records to import
2387 source records ADDED
1125 source records UPDATED
544 records DELETED from the target
+++++ IMPORT DONE

Import SUCCEEDED
Process FINISHED normally

Files have been moved to 'D:\DDTI\Data Import Server\Data\FileGeodatabase\Finished\131693296691009529-EXPORT_PRODUCT.gdb'
```

The load process performs a change detection against the data that currently exists in DataManager, and only processes records that have changed.

If minimum data requirements are not met (e.g., expected layers are missing from the source data, duplicate unique IDs are present, or spatial inconsistencies such as invalid geometry or multi-part features are detected), email notifications will be sent identifying the errors. As a result, processes can be placed on hold until corrections are made, and remediated data is uploaded.

The following screenshot is a sample email report showing a failed update of an address point layer (the errors shown are for duplicate IDs in the unique ID field). It is important to note this report solely

indicates the update was unable to be processed; this is not a report for actual spatial quality errors in the data, which occurs following a successful update.



Results for Spatial Data Import to Example:

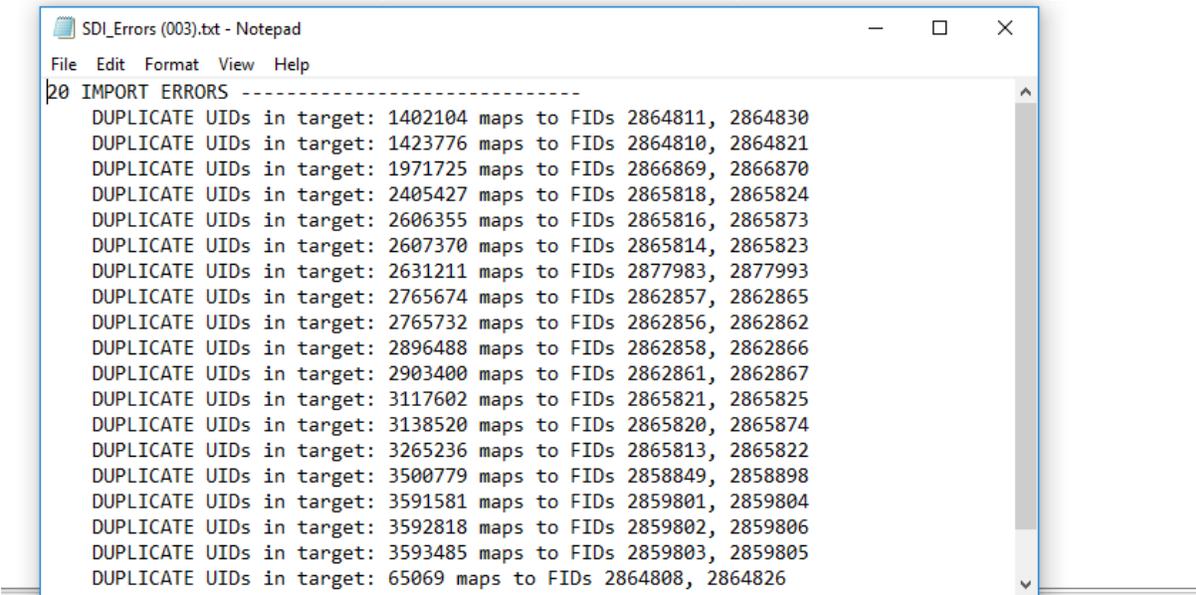
Import Layer: Address_Points -> Addresses (SkipOnErrors=True, AllowMultiGeometry=False, BlankOutUnmappedFields=False, PartialDatasetDetection=True (diff of 10% or 300000 records triggers partial), AliasRecordsCheck=False (ExpectedCount=-1, DeviationPercent=-1), CommitFrequency=1000, DataTable=False, ChangeReport=False (ReportName=ChangeReport, ChangeTypes=AMD, NewPrefix=NEW_, OldPrefix=OLD_, EmailReport=False, ReportDir=), 26 fields).
Source file: 'D:\DDTI\Data Import Server\Drops\FDB\MassAddresses\EXPORT_PRODUCT.gdb [Address_Points], ID=131462546880251231'.

Target validation SUCCEEDED
Source validation SUCCEEDED

+++++ IMPORT STARTED
3361125 source records to import
+++++ IMPORT DONE WITH ERRORS

Import FAILED
Process FAILED with errors
Review the attached file for error details.

Files have been moved to 'D:\DDTI\Data Import Server\Data\FileGeodatabase\Incomplete\131462546880251231-EXPORT_PRODUCT.gdb'



If the data passes the import checks, it will be loaded into DataManager where more granular and spatial quality controls are performed. If there are any discrepancies, this process updates the quality control tables.

Data Quality Control

When all data has passed the QCs for the Data Importing Service, the DataManager's Staging Database will be populated with the GIS records that have changed from the previous successful import. The load

into the DataManager system does not do a complete overwrite; rather, it performs a change detection operation. As a result, a full historical record of all data changes can be maintained by the system, and detailed results of any load errors are provided.

GIS attribute and spatial integrity will be evaluated at this stage. Each layer will undergo QCs with a specific purpose of identifying issues before implementation. The issues are broken into the categories of Call Routing issues and Map Display issues. Each QC carries a severity designation of Critical, High, Medium or Low. If critical errors are found at this stage of the process data will not be published to the ECRF and LVF until they are remediated, however High, Medium, or Low will not impact the provisioning process. The Staging Database outputs results of the QC process that can be easily consumed by the agency responsible for remediation along with a notification that they are available. Because the files analyzed are spatial, web maps can be utilized for consumption or file formats can be distributed via secure file transport mechanisms. If no Critical errors exist, then data is provisioned to the ECRF and LVF with a successful publish email.

The severity level assignment for each QC should be discussed with all stakeholders and recommendations can be made based on experience from operational deployments. To provision the data to the ECRF and LVF the data must not violate any critical severity QCs.

QC examples can be seen in the table below:

GIS Layer	QC Description	Severity
Address	Address Muni must not be empty.	Medium
Address	Duplicate address name set with different locations.	Medium
Address	Address is outside of Provisioning Boundary.	High
Address	Duplicate address name set in different PSAPs.	High
Address	Address State must not be empty.	Critical
Address	Address Country must not be empty.	Critical
Address	Address House Number and Landmark should not be empty simultaneously.	High
Address	Not a registered value for Address MSAG Community.	Medium
Address	Not a registered value for Address PRD.	Medium
Address	Not a registered value for Address POD.	Medium
Address	Not a registered value for Address STS.	Medium
Address	Not a registered value for Address STP.	Medium
Address	Not a registered value for Address County.	Medium
Road	Road has invalid or non-Linestring geometry.	High
Road	Road must have a street name.	High
Road	Beginning point of segment not aligned at intersection.	High
Road	Ending point of segment not aligned at intersection.	High
Road	Road Left parity does not match address range.	High
Road	Road Right parity does not match address range.	High
Road	Road Left address range is invalid.	High
Road	Road Right address range is invalid.	High
Road	Road Left County must not be empty.	Medium
Road	Road Right County must not be empty.	Medium

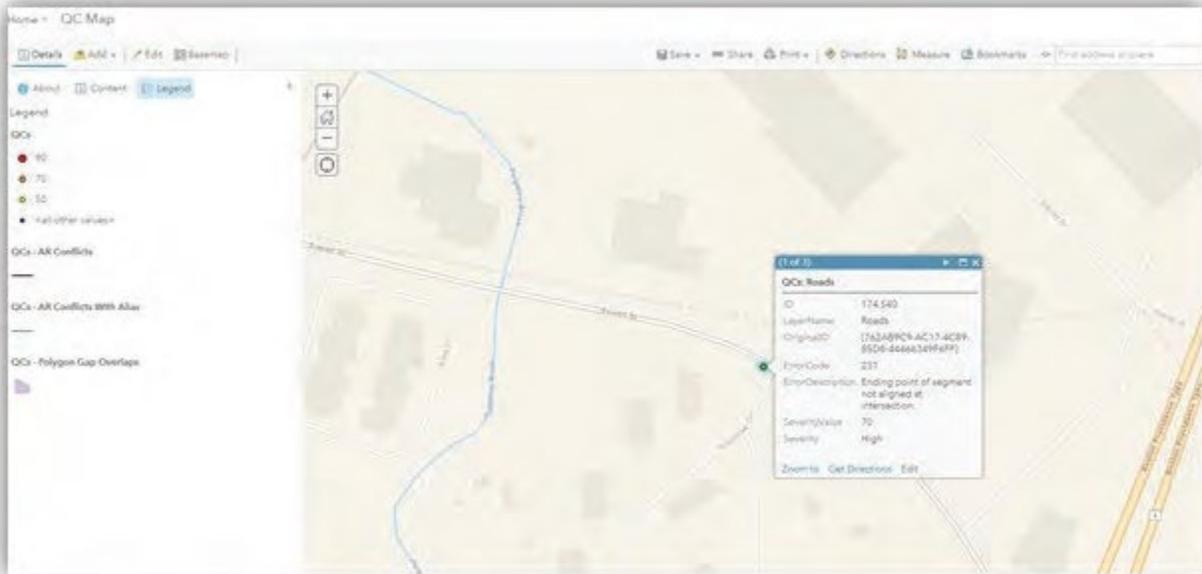
Road	Road Left State must not be empty.	Critical
Road	Road Right State must not be empty.	Critical
Road	Road Left Muni must not be empty.	Medium
Road	Road Right Muni must not be empty.	Medium
Road	Road Left Country must not be empty.	Critical
Road	Road Right Country must not be empty.	Critical
Road	Road falls outside of Provisioning Boundary.	High
Road	Address Range conflict.	High
Road	Address Range conflict with aliases.	High
Road	Not a registered value for Road Left MSAG Community.	Medium
Road	Not a registered value for Road Right MSAG Community.	Medium
Road	Not a registered value for Road PRD.	Medium
Road	Not a registered value for Road POD.	Medium
Road	Not a registered value for Road STS.	Medium
Road	Not a registered value for Road STP.	Medium
Road	Not a registered value for Road Left Validation Flag.	Medium
Road	Not a registered value for Road Right Validation Flag.	Medium
Road	Not a registered value for Road Left County.	Medium
Road	Not a registered value for Road Right County.	Medium
Service Boundary	Service boundary override service URN must not be empty.	Critical
Service Boundary	Service boundary display name must not be empty.	Medium
Service Boundary	Service boundary has one or more invalid URIs.	Critical
Service Boundary	Service boundary SIP URI must start with sip: or sips:.	Critical
Service Boundary	Service boundary SIP URI is not a known URI.	Critical
Service Boundary	Service boundary SIP URI is missing.	Critical
Service Boundary	Service boundary overlaps another.	Critical
Service Boundary	Service boundary extends beyond Provisioning Boundary.	High
Service Boundary	Gap in service boundary layer.	Critical
Service Boundary	SQL geography is not valid.	Critical

DataManager includes a quality control (QC) process that runs continuously and evaluates updates as they are incorporated into the core database. The output of these checks is one or more (depending on the QC checks that are used) QC error layers in the DataManager system.

Users can view QC error layers directly using the Data Maintenance Service user interface, and/or can have errors published out as an Esri ArcGIS web service feature layer (although the errors can also be sent to the county in a file-based format), allowing the GIS users to add this layer to ArcMap to provide real context to the location and nature of the errors. The QC checks can be assigned to several different

classifications: geocoding, standards, internal consistencies, and external consistencies (if any). These checks include most of the tests that were used during the data quality control and synchronization phases.

The following screenshot shows a sample quality control error layer displayed in ArcGIS Online.



Data Publishing

The Data Publishing function transforms, formats, and exports the data from the core database into files or other databases based on the client's needs. The publishing of the data can be restricted based upon the severity of errors detected during the QC process. Individual QCs are assigned to a customizable severity level, and individual thresholds can be configured for each severity level and GIS layer. These thresholds can be based on either the absolute count of errors or the relative rate of errors in the layer. If any of the QC error thresholds are violated, the publish process will be blocked. It is also possible for an administrator to configure a given publishing task to ignore the QC error thresholds, if needed.

Data publishing tasks can be initiated on demand, scheduled as a one-time publish, scheduled as a reoccurring publish, or can be triggered automatically by any changes following the completion of QC checks.

A database layer can be setup to be published to multiple user defined export files. Each one of these exports can be customized in a limited way. The specific fields to export can be designated, and the output field name and format can be configured.

Data Exporting Service

The Data Exporting function transforms, formats, and exports the data from the core database into the

ECRF/LVF or other databases based on the client's needs. The publishing of the data can be restricted based upon the severity of errors detected during the QC process. Individual QCs are assigned to a customizable severity level, and individual thresholds can be configured for each severity level and GIS layer. These thresholds can be based on either the absolute count of errors or the relative rate of errors in the layer. If the any of the QC error thresholds are violated, the publish process will be blocked. It is also possible for an administrator to configure a given publishing task to ignore the QC error thresholds, if needed.

Data publishing tasks can be initiated on demand, scheduled as a one-time publish, scheduled as a reoccurring publish, or can be triggered automatically by any changes following the completion of QC checks.

System and Data Reporting

- QC error summary counts are available via the DataManager website, as well as detailed counts by error type/description.
- Change report summaries and counts are available on a scheduled basis.
- Publishing failures (due to excessive QC errors, for example) can be configured to generate email notifications.
- The system contains all the historical data along with a time stamp and user ID for any changes.

Administrative Control

- The DataManager website provides a secure administrative interface.
- Administrators can configure quality control and data publishing from the website.
- Administrators can also control users, permissions, and display options.
- Administrators can request a rollback to a previous database state if necessary.

3.1 GIS Data Management Tools

COMPLY

DDTI realizes the experience levels can vary from PSAP to PSAP and we strive to keep the submission of GIS data, MSAG and other additional relevant layers as streamlined and simple as possible using SFTP.

Because local jurisdictions may not have their GIS data in the required NENA format, DDTI will provide translation rules that will convert source data into CLDXF so it can be published to the ECRF/LVF.

Data importing has the following areas of functionality available:

1. **Data Update Monitoring** - Monitors a configured destination location for the data submission process. If an update is detected, the Data Import processes will automatically start.
2. **Data Schema Verification** - Checks submitted data against the configured local schema to verify the data transformation can be applied. If there are any schema issues or specific record issues,

they will be reported to the local data provider via email. The email will include detailed information concerning the specific errors.

3. **Data Transformation** – Converts submitted data into the Next Generation GIS dataset schema using the configured transformation(s).
4. **Data Coalescence** - The set of the most current transformed local datasets are coalesced to form the ECRF dataset for updating the DataManager database. This coalescence transformation may include some topological-based transformations depending on the configuration.
5. **Error Notification** - Users will be provided near real-time feedback of data validation issues and can optionally view an error layer directly in their locally installed Esri ArcMap.

3.2 GIS Normalization Services

COMPLY

Overview

Regardless of the data source (State or Local) the GIS data and processes will need to be prepared to be published to the appropriate ECRF(s). This process is called Data Normalization and is a one-time setup project per data source. There are a few primary goals that need to be achieved for the Next Gen system to work correctly and efficiently:

- The GIS input data should be internally consistent. For example, the roads should have consistent names, be intersected properly, not have address range overlaps, etc.
- The GIS input data should be externally consistent. For example, the roads and addresses should be using the same naming convention.
- The GIS data needs to be synchronized to the MSAG and ALI data. The GIS will form the basis of the ECRF database. The ALI data will form the basis of the LDB data. For a call to route properly, LDB data must match correctly to the ECRF data. This matching property will be checked using the Location Validation Function (LVF). Of course, the easiest way to ensure such a relationship is to start with the GIS and ALI data already synchronized properly prior to the data transformations for the Next Gen data set.
- The data transformation must be setup to generate the Next Gen data set. This includes field mappings, variable types, spatial coordinate systems, and actual individual field values. Each required Next Gen field must have either a source in the GIS data or a consistent rule for it to be calculated. For example, the GIS street name elements must be matched up to the Next Gen street name elements. Or if the A1 field is not provided and is necessary for the Next Gen data, then a rule can be applied to calculate it to the proper State value.

A key objective of the project is to design, implement and maintain the Emergency Call Routing Function (ECRF) dataset as an aggregation of local data sources. This ECRF dataset should meet the accuracy requirements necessary to support the ECRF call route determination functionality in a Next Generation 9-1-1 (NG9-1-1) system. There are three primary processes that are necessary to reach this objective:

1. Dataset Definition
2. Process Design for Each Jurisdiction
3. Data Normalization

Dataset Definition

ECRF/LVF Datasets

It is necessary to define the schema and metadata for the ECRF dataset. DDTI will work in conjunction with the primary project stakeholders to determine the required layers, fields, and accuracy requirements for this dataset.

NENA Standards for the Provisioning and Maintenance of GIS data to ECRFs and LVFs (NENA-STA-005.1-2017) defines the ECRF/LVF provisioning data model. The ECRF/LVF requires service area boundaries, and address location data. The ECRF/LVF does not require a wide variety of other GIS data layers that are useful for tactical dispatch mapping, such as aerial or satellite imagery, hydrography, topographic maps, fire hydrant locations, infrastructure maps, and so on. The ECRF/LVF should be thought of as using a subset of available GIS layers, and not all GIS layers used for other 9-1-1 functions.

For each layer, the schema will need to be defined. The NENA Standard for NG9-1-1 GIS Data Model (NENA-STA-006.1-2018) is the primary GIS data structure guideline. Consideration towards Appendix B (SI Provisioning Data Model) of the NENA Detailed Functional and Interface Standards for the NENA i3 Solution (NENA-STA-010.2), and the NENA Next Generation 9-1-1 (NG9-1-1) United States Civic Location Data Exchange Format (CLDXF) Standard (NENA-STA-004.1.1) to determine which spatial layers are used and which fields are required, conditional, and optional. Finally, the target accuracy statistics should be set for both MSAG/ALI data synchronization and the Next Generation simulation quality tests. In our experience, it is critical to the success of any data project to clearly define the data model and accuracy expectations.

Auxiliary Datasets

Auxiliary Datasets can be defined as optional GIS layers that support the business practice of 9-1-1 call routing and other downstream elements (e.g., Map Database Service, MSAG Conversion Service, Geocoding Service, PSAP Map Display, etc.).

Typically, Dataset Definition will cover the following information:

Suggested Data Assessment Task	Description
Document Layers Provided	List all Layers and Source
Verify that there is data source for each Mandatory Layer	Mandatory Layer in ECRF dataset
Document Optional Layers that have a data source	Optional NG9-1-1 Layers
Document the Fields in Each Layer	List all fields and data type

Map the provided fields to the NENA GIS Data Model	Map the provided Layers and Fields to the ECRF dataset
Verify All Mandatory Fields are present	Mandatory fields in the ECRF dataset
Verify All Mandatory Fields contain data	Not <Null>
Document all Conditional Fields	Conditional fields in the ECRF dataset
Verify that Conditional Fields meet the conditions	Review data content to ensure that the conditions are fulfilled
Document all Optional Fields	Fields not used in the ECRF
For each layer review all fields (Mandatory/Conditional/Required) to identify necessary data transformations	Example: Street Type element is abbreviated in Data Source vs. spelled out in data model
Identify and Report Data Source vs. Data Model gaps	Review the Data Requirements for the Project and possible gaps in the various Data Sources
Verify Data Transformations with Data Source	Confirm Data Transformations are correct
Work with Data Source to Identify Data Creation/Upgrade/Clean-up Needs	Review needs and select action for Data Remediation; document Data Source needs for Data Remediation
Review Data Maintenance Processes and Tools with Data Source	Review that the Data Source can maintain the fields required for the project
Work with Data Source to Identify Training Needs	Identify training needs about Data Remediation and Maintenance
Document Data Requirements to Support Existing Systems	Document the data requirements (layers, fields, and formats) that may generate constraints on the data transformations

Process Design for Each Jurisdiction

Data Integration Design

Each local dataset will need to be reviewed, documented, and the Local Data to ECRF transformations designed and tested. DDTI will meet with each local entity to define the source for each of the required layers. Once this has been determined, the GIS Analyst will work with individual sources to document the layer metadata and design the specific data transformations for the layer. Any gaps between the local data and the ECRF dataset model will be documented and reported for resolution.

Discrepancy Testing and Remediation

The discrepancy testing and remediation process is an iterative cycle of data updates, testing, and remediation. In the long term, this cycle is the core of the maintenance process and is continuous to ensure discrepancies are reviewed and corrected as necessary to maintain the proper functionality in the Next Generation system.

DDTI will support the client as necessary to facilitate the data discrepancy resolution. Our clients have a broad spectrum of GIS and Next Generation 9-1-1 experience and knowledge. In many cases, DDTI goes beyond simply reporting discrepancies and works directly with the client to ensure it is clear why it is a discrepancy, how it can affect the ECRF functionality, and review remediation options available.

As expressed in the NENA GIS Data Collection and Maintenance Standards document (NENA 02-014), the use of property tax information, ALI, MSAG, Utility databases, and other source information that has address information for use in QA/QC, will greatly aid in resolving discrepancies by cross auditing multiple datasets.

The integration of additional data sources at this stage provides the benefit of cross-audits to aid in decision making where gap analysis requires a decision for resolution. Results from those decisions may allow incorporation from the additional datasets to strengthen the completeness and accuracy of the 9-1-1 datasets.

Local Process Tuning

Another important aspect of the project is to integrate the process as closely and painlessly as possible with the local user's standard operating procedures. We will work with the end user to tune the process to fit their needs. The key to this in our experience is to be as flexible as possible concerning the components that integrate local systems with the DataManager. This includes the data transformations, editing, submission, and reporting. In addition, the local users may require specific custom exports to support external systems like CAD, Dispatch Mapping, and non-9-1-1 systems.

Data Normalization

During normalization, DDTI will ensure that the data passes the QA/QC test for meeting the GIS schema. This workflow will continue each time that GIS data is modified by a PSAP. DDTI will identify all discrepancies and follow the discrepancy workflow for error resolution.

Once the source data meets these minimum requirements, DDTI will map all possible fields for import into DDTI's automated QC process. Following import, the system will perform additional QC checks for topology and attribute consistency and produce documentation on the various errors and warnings. Where applicable, the documentation will have X and Y coordinates for spatial representation in GIS software to represent the data discrepancy along with a location for remediation. DDTI's GIS analysts will provide this information in the requested format with specific recommendations for corrective actions to be made by the designated parties.

Additional QCs will take place when the MSAG and ALI validation routines are run, providing a report of the mismatches. Past processing of this validation indicates most errors will be in the ALI database, but this report can provide useful information for fixing the GIS data when necessary. Comparison of civic locations to the ALI is intended to significantly reduce or eliminate the chance for errors during actual emergency calls for E9-1-1. In NG9-1-1, civic locations are pre-validated against the LVF.

In NG9-1-1, the LoST server (ECRF and LVF) geocodes all Civic Address queries to compare the geographic location to service boundary polygons. Addresses are considered to have a highest quality rating and will be checked against first before looking for potential road centerline matches. This process ultimately results in a call routing URI in the LoST response.

Once the data has been combined and has passed the data requirements for each layer, the next step will be to synchronize and test the various data layers for global consistency. The goal of the Data Normalization process is to ensure that all the separate 9-1-1 layers are consistent with each other. In addition, the NG9-1-1 data must be augmented by and agree with the legacy E9-1-1 system layers, the ALI and MSAG data. The following table illustrates the relationships that will be tested.

	Road Centerlines	Address Points	ALI	MSAG	ESB Polygons	PSAP Polygons
Road Centerlines	X	Address Points to Centerlines	ALI to Centerlines	Valid MSAG Addresses to Centerlines	X	X
Address Points	X	X	X	X	X	X
ALI	X	Address Points to ALI	X	X	ESB Polygons Attributes to ALI	PSAP Polygons Attributes to ALI
MSAG	Road Centerlines to MSAG	Address Points to MSAG	ALI to MSAG	X	ESB Polygons Attributes to MSAG	PSAP Polygons Attributes to MSAG
ESB Polygons	Road Centerlines to ESB Polygons	Address Points to ESB Polygons	Geocoded ALI to ESB Polygons	Geocoded Valid MSAG Addresses to ESB Polygons	X	PSAP Polygons to ESB Polygons
PSAP Polygons	Road Centerlines to PSAP Polygons	Address Points to PSAP Polygon	Geocoded ALI to PSAP Polygons	Geocoded Valid MSAG Addresses to PSAP Polygons	ESB Polygons to PSAP Polygons	X

ALI, MSAG and Centerline Tests	
ALI to Road Centerlines	Each ALI record should geocode to a unique road segment. There must a unique road segment with matching street name fields that contains the house number of the ALI record. If there is no matching record, then the data must be corrected to bring it into synchronization. The case where there are multiple matches should not occur.
Valid MSAG Addresses to Road Centerlines	The MSAG records will be converted into a set of valid MSAG addresses. For example, an MSAG record for N,Main,St,Madison,100,200,B (N Main St Madison from 100 to 200 all integers) will be converted to a list of addresses 100 N Main St Madison, 101 N Main St Madison, ... , 200 N Main St Madison. Each valid MSAG Address should have a unique geocoding match in the Road Centerlines data. If the Road Centerlines data has passed the internal check concerning overlaps, no multiple matches should exist. This leaves two outcomes: no matches and 1 match. The valid MSAG address records with no matches would need to be reviewed and the appropriate correction applied.
Road Centerlines to MSAG	In this test, only the Street Name elements and MSAG community are used to compare the Road Centerlines and MSAG information. In general, for every MSAG record there must exist at least one Road Centerline record where the Street Name elements for both records match (the ECRF is not permitted to have partial matches) and the MSAG Community matches for both records. These tests will help verify that the Street Name elements and MSAG values are in fact synchronized with each other.
ALI to MSAG	Each ALI record should match a unique MSAG record. The matching technique is very similar to the geocoding process, but since the MSAG is not spatial in nature, no location is estimated for the ALI record. If there is no matching record, then the data must be

	corrected to bring it into synchronization. There should be no cases where multiple matches occur. While it is usually assumed that this relationship is by default true, most data sets will exhibit some differences.
Address Point Tests	
Address Points to Road Centerlines	For each address point there should be a unique road centerline record that matches the street name fields and whose address range contains that address point. There can be exceptions and each case will be examined. Once a unique match has been found, the spatial relationship between the address point and the corresponding road segment can be tested.
Address Points to ALI	Each ALI record should match to a unique Address Point record. If there is no matching record, the data must be corrected to bring it into synchronization. The case where there are multiple matches can occur due to the non-standard encoding of extra address information (Lot 52, Suite 101, etc.) in the ALI data.
Address Points to MSAG	Each Address Point should match a unique MSAG record. If there is no matching record, then the data must be corrected to bring it into synchronization. The matching technique is very similar to the geocoding process, but since the MSAG is not spatial, no location is estimated for the Address Point record. If there is no matching record, then the data must be corrected to bring it into synchronization. Multiple matches should not occur because the MSAG data has passed internal consistency tests.
Polygon Tests	
Road Centerlines to ESB Polygons (spatial)	Road Centerlines will need to be spatially synchronized to the ESB Polygons. Each segment will be compared to the ESB Polygons. Segments can only be contained in one Polygon (ignoring boundary conditions). If the two layers share attributes, they can be compared.
Road Centerlines to PSAP Polygons	Road Centerlines will need to be spatially synchronized to the PSAP Polygons. Each segment will be compared to the PSAP Polygons. Segments can only be contained in one Polygon (ignoring boundary conditions). If the two layers share attributes, then they can be compared also.
Address Points to ESB Polygons	If the Address Points and the ESB Polygons share attributes, then these attributes can be checked by using the spatial relationship between the Address Points and the ESB Polygons. Each Address Point will be compared to ESB Polygon that contains it.
Address Points to PSAP Polygons	If the Address Points and the PSAP Polygons share attributes, then these attributes can be checked by using the spatial relationship between the Address Points and the PSAP Polygons. Each Address Point will be compared to PSAP Polygon that contains it.
Geocoded ALI to ESB Polygons	This test can be performed if there are attributes that are shared between the ALI records and the ESB Polygons, for example MSAG Community. The ALI records will be geocoded to the Road Centerlines and then will be compared to the ESB Polygon that contains it.
Geocoded ALI to PSAP Polygons	This test can be performed if there are attributes that are shared between the ALI records and the PSAP Polygons, for example MSAG Community. The ALI records will be geocoded to the Road Centerlines and then will be compared to the PSAP Polygon that contains it.
Geocoded Valid MSAG Addresses to ESB Polygons	This test can be performed if there are attributes that are shared between the MSAG records and the ESB Polygons, for example MSAG Community. The MSAG records will be converted to the set of all valid MSAG addresses. These addresses will be geocoded to the Road Centerlines and then will be compared to the ESB Polygon that contains it.

Geocoded Valid MSAG Addresses to PSAP Polygons	This test can be performed if there are attributes that are shared between the MSAG records and the PSAP Polygons, for example MSAG Community. The MSAG records will be converted to the set of all valid MSAG addresses. These addresses will be geocoded to the Road Centerlines and then will be compared to the PSAP Polygon that contains it.
ESB Polygon Attributes to ALI	This is a simple attribute domain check. If the two layers share attribute information, then the domains can be compared.
ESB Polygon Attributes to MSAG	This is a simple attribute check. If the two layers share attribute information, then the domains can be compared. For example, if the MSAG records contain a MSAG Community that does not occur in the ESB Polygon data then this will generate a warning.
ESB Polygons to PSAP Polygons	This is a simple attribute domain check. If the two layers share attribute information, then the domains can be compared.
PSAP Polygon Attributes to ALI:	This is a simple attribute domain check. If the two layers share attribute information, then the domains can be compared.
PSAP Polygon Attributes to MSAG	This is a simple attribute check. If the two layers share attribute information, then the domains can be compared. For example, if the MSAG records contain a MSAG Community that does not occur in the PSAP Polygon data then this will generate a warning.
PSAP Polygons to ESB Polygons	This is a simple attribute domain check. If the two layers share attribute information, then the domains can be compared.

3.3 GIS Managed Services

COMPLY

The process utilized to import and QA/QC GIS data will continue after the Data Normalization process is completed.

- DDTI will provide web-enabled reports that can be viewed via the DataManager Website.
- Discrepancies can be delivered via Esri online services for GIS providers that use ESRI.
- The system status is reported via the DataManager website.
- DDTI will provide written documentation of all data discrepancies, support staff to answer questions about the errors and state of the system and assist local GIS authorities with suggestions concerning how to resolve discrepancies as needed.
- DDTI will provide 24x7x365 customer support.
- DDTI will ensure that GIS corrections that pass QA/QC processes will be dynamically updated to the core routing platform. The frequency of these updates will be determined by the authoritative GIS sources.

4 Project Management

COMPLY

DDTI will provide project management and coordination to ensure the success of the overall project, including maintaining regular contact with the 9-1-1 board, the State project management office, as well as the NG9-1-1 service provider to configure and implement the geographic (location based) call routing functionality.

4.1 Single Point of Contact

COMPLY

DDTI shall designate a PMP certified Project Manager who will be a single point of contact (SPOC) for the 911 Board and the Board's designees. This individual will provide project management and coordination to ensure the success of the project and will maintain regular communication with the 9-1-1 board, the State project management office and the NG9-1-1 service provider to configure and implement the geographic (location based) call routing functionality.

DDTI has a pool of qualified project managers and understands the assigned individual will remain engaged for the life of the project and will only be replaced upon written approval by the 911 Board. Sample resumes are as follows:

ALEX KIENE, PMP		
Experience		
Digital Data Technologies, Inc	Project Manager, Data Services	2007 - Present
Education		
The Ohio State University	Bachelor of Science in Business Administration	2005
Qualifications		
From 2016- 2018 Mr. Kiene managed the Spatial Interface Project for the National Capital Region (NCR). Through consulting, data normalization, and adherence to NENA standards, the jurisdictions encompassing the NCR produced a GIS dataset that could be implemented into a Next Generation 9-1-1 system. Utilizing quality control tools developed by Digital Data Technologies Inc., refined PSAP boundary polygons were also developed for the region.		
JIMMIE FOUT, PMP		
Experience		
Digital Data Technologies, Inc.	Project Coordinator	2018 to Present
	GIS/GPS Analyst	2008 to 2018
Education		
Ohio University	Master of Business Administration	2016
	Bachelor of Science in Geography	2007
Qualifications		
Mr. Fout is a well-versed member of the DDTI GIS Implementation Team. He has managed Data Collection Projects in Ohio, and NextGen 911 projects for Data Normalization and Data Analysis in California and Montana. He has assisted in the development of methods and standards for Data Normalization and reporting which DDTI uses regularly. Mr. Fout is a certified Project Management Professional (PMP).		

4.2 Project Kick-off Meeting

COMPLY

DDTI views the project kickoff meeting as an opportunity to lay the foundation for a successful project and ensure the stakeholders and the project team are on the same page regarding scope, goals, budget and timeline.

DDTI's project manager will coordinate an in-person project kick-off meeting with the 911 Board's representatives and additional stakeholders as necessary. The objective of the project kick-off meeting is to:

- Introduce the individuals assigned to the project.
- Provide an executive summary of the project's objectives and desired results.
- Review the scope of the project and what deliverables are expected.
- Define roles and responsibilities.
- Communicate a high-level project schedule including important milestones.
- Discuss reporting requirements.
- Review a preliminary action plan.

4.3 Project Planning

COMPLY

Project planning will follow the practices and techniques reflected in the Project Management Body of Knowledge (PMBOK Guide) from the Project Management Institute. We follow the defined process groups (Initiating, Planning, Executing, Monitoring and Controlling and Closing).

At a minimum, DDTI will provide the following:

- **Scope Management Plan** including a Work Breakdown Structure (WBS) representing a top-down hierarchical description of the work required to achieve the mission and satisfy stakeholders and acceptance criteria.
- **Communications Management Plan** defining the communication requirements for the project and how information will be distributed.
- **Schedule Management Plan** that includes the methodology used to create the schedule, measurement guidelines, the duration for each activity and the efforts required for those activities.
- **Risk Management Plan** to define anticipated risks and provide a plan to resolve them if they occur. It includes risk management planning, risk identification, the qualitative and quantitative analysis of risks, risk response planning, monitoring and controlling the risk responses.
- **Change Management Plan** defining activities and roles to manage and control change during the execute and control stage of the project.

4.4 Project Status Reporting

COMPLY

A project status report includes all the business-critical efforts, progress and risk associated with a project. It is a snapshot of where things are and helps to uncover issues, mitigate risks, and ensure project goals are on track.

DDTI views the project status report is a critical part of an effective project communications and management strategy. The project management report should include:

- **General Project Information** – Includes project name, project manager, number of resources, etc.
- **General Status Information** - Includes what date the report was generated, who is the author and so on.
- **Milestone Review** - The milestones are major phases of the project and they break up the larger project into more digestible parts. This review should note where the project is in terms of meeting those milestones relative to what the plan says it should be at this point in the project's life cycle.
- **Project Summary** – A summary of the forecasted completion date and costs of the project. This includes the tasks that are facing issues, how those problems might impact the deadline and costs, what is planned to resolve these issues and the expected results once the problem is fixed.
- **Issues and Risks** – Lists the issues and risks that have arisen over the course of the project to date. It should note what they are, how they are being resolved and what impact they'll have on the overall project.
- **Project Metrics** – Reporting against established metrics shows if the project on track and evaluates what, if anything, needs attention.

These reports can be created weekly, with a final report provided at the conclusion of the project.

Appendix 1 – Additional Responses to AL-GIS-RFP-19-002

Attachment B – Business Proposal

2.3.1 General

Based on DDTI’s past performance on engagements requiring business objectives substantially identical to those required by the Alabama 9-1-1 Board, we are highly confident we can accomplish the stated business objectives and achieve industry standards compliance with quality, cost effectiveness and timeliness.

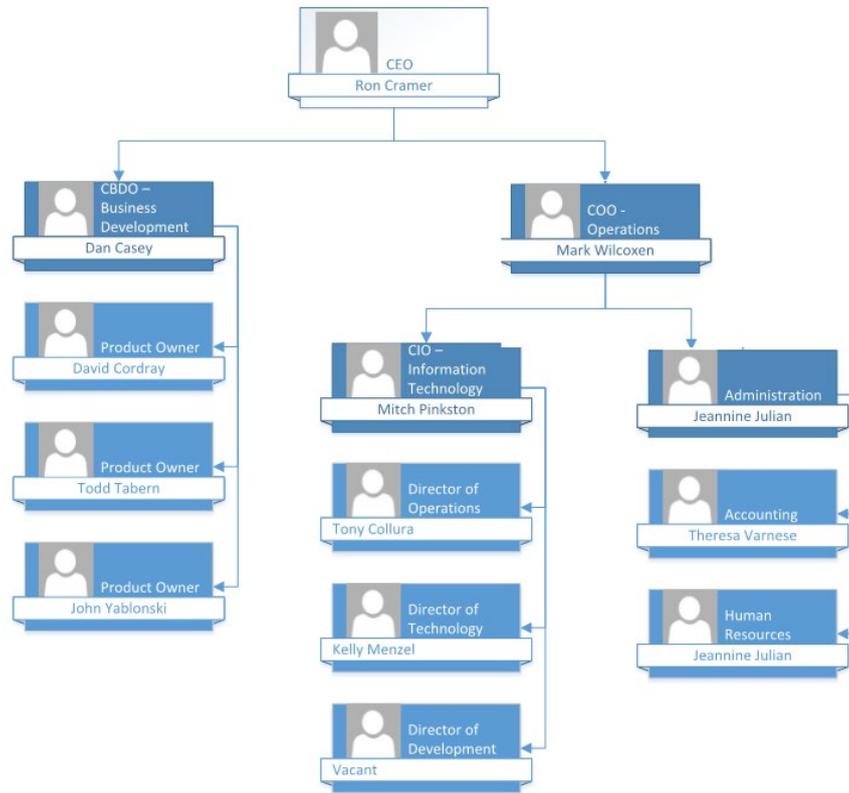
DDTI’s value to the Alabama 9-1-1 Board includes:

- DDTI is a fully integrated business partner with INdigital.
- DDTI has experience supporting a phased approach to NG9-1-1 implementations. This includes utilizing service area boundaries to geospatially route cellular calls, GIS data normalization projects and the successful replacement of legacy ALI systems with a Location Database (LDB) and MSAG Conversion Service (MCS).
- The solutions provided by DDTI for this project will make the transition to NG9-1-1 faster and simpler. The standardized and corrected datasets will be provisioned into the ECRF/LVF utilizing the Spatial Interface (SI) capability
- Jurisdictions will not need to alter their existing GIS data structures to build the authoritative GIS model. As data is submitted and quality controlled, it is transformed into the NENA CLDXF format.
- An ESRI web layer is available to jurisdictions to display QA/QC errors and facilitate data corrections utilizing familiar ESRI software tools. For jurisdictions without ESRI software capabilities.

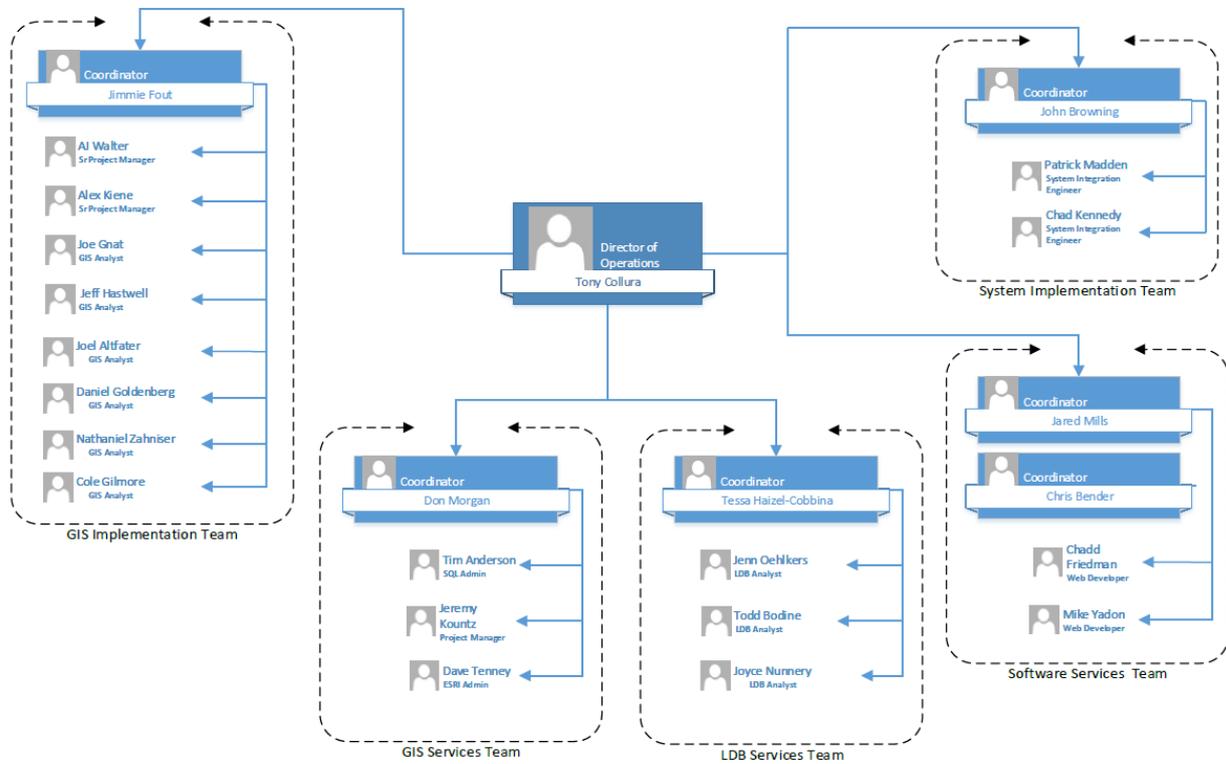
2.3.2 Respondent’s Company Structure

<p>Digital Data Technologies, Inc. 2323 W. Fifth Avenue, Suite 210 Columbus, OH 43204 Phone: (614) 429-3384 Fax: (614) 429-3385 Website: www.ddti.net Year Incorporated: 1998 State of Incorporation: Ohio Ownership: S Corporation</p> <p>Contractual Point of Contact Attn: Ron Cramer, CEO (614) 429-3384 ext. 222 rcramer@ddti.net</p> <p>Proposal Related Questions Attn: Dan Casey, CBDO (614) 429-3384 ext. 223 dcasey@ddti.net</p>	<p>UNITED STATES OF AMERICA STATE OF OHIO OFFICE OF THE SECRETARY OF STATE</p> <p><i>I, Frank LaRose, do hereby certify that I am the duly elected, qualified and present acting Secretary of State for the State of Ohio, and as such have custody of the records of Ohio and Foreign business entities; that said records show DIGITAL DATA TECHNOLOGIES, INC., an Ohio corporation, Charter No. 1027713, having its principal location in Columbus, County of Franklin, was incorporated on August 28, 1998 and is currently in GOOD STANDING upon the records of this office.</i></p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: right;"> <p><i>Witness my hand and the seal of the Secretary of State at Columbus, Ohio this 13th day of December, A.D. 2019.</i></p> <p><i>Frank LaRose</i></p> <p>Ohio Secretary of State</p> </div> </div> <p style="font-size: small; margin-top: 10px;">Validation Number: 201934702898</p>
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Management Team



Operations Team



2.3.11 Experience Serving State Governments

Since 1998, Digital Data Technologies, Inc. (DDTI) has been providing state-of-the-art software and GIS services to the 9-1-1 industry and local government agencies.

At the forefront of Next Generation 9-1-1 (NG9-1-1), DDTI has developed and installed key components ensuring reliable and timely emergency call routing. Our i3 compliant software includes an Emergency Call Routing Function (ECRF), Location Validation Function (LVF), Location Database (LDB), Spatial Interface (SI) and MSAG Conversion Service (MCS). We also provide map display software providing location awareness for 9-1-1 dispatchers in over 1,000 PSAPs nationwide.

Our products are currently supporting NG9-1-1 deployments in the Commonwealth of Massachusetts, St. Louis County and several counties in Ohio. We have worked with multiple CPE vendors (e.g., Airbus, Motorola (ECW) and Westel) to ensure our software interfaces effectively.

DDTI continues to work closely with the National Emergency Number Association (NENA) to develop standards and protocols for NG9-1-1 and has participated in multiple NENA Industry Collaboration Events (ICE). DDTI is proud to have been recognized by NENA with a certificate of appreciation for our outstanding contribution to the development of ECRF/LVF i3 standards.

In addition to software, DDTI is a leading provider of Geographic Information System (GIS) services to State Governments. We have collected, processed and delivered precise and complete GIS datasets for over 70 counties throughout the United States. Our field teams utilized our custom Voice and Information Recording Data Acquisition (VIRDA) system (comprised of digital voice recording, survey-grade GPS receivers, inertial navigation and distance measuring equipment) to collect and verify over 100,000 miles of public roadway centerline and address information.

DDTI currently provides over 50 County Assessors with an intuitive web-based solution offering immediate access to property information. The availability of online data for citizens and County staff results in increased accuracy, satisfaction and productivity. Property searches can be conducted by parcel numbers, owner's name or address. Legal description appraised and assessed property values, and other valuable information are readily available. Frequent users of the website can save search results for future retrieval. Detailed GIS mapping integrates with CAMA data, and county map details can include aerial photography.

We have conducted over 100 comprehensive data validation analyses to discover and reconcile discrepancies between ALI, MSAG and GIS data and facilitate NG9-1-1 migrations. Our processes ensure uniformity, accuracy and adherence to NENA standards.

Providing NG9-1-1 GIS data normalization services for the Commonwealth of Massachusetts, the County of St. Louis, the National Capital Region and other jurisdictions (over 12 million citizens) in preparation of NG9-1-1 deployments.

DDTI is currently reviewing the road and address data for all 88 Ohio Counties and defining the data transformation(s) necessary to map the data to the Location Based Response System (LBRS) schema and spatial requirements (e.g., all roads are segmented at the necessary boundaries, jurisdictional

edges are spatially matched to other County data sets and roads are not unnecessarily segmented). Missing source fields or other data deficiencies are reported to the County and ODOT.

The final data sets will be provided in the proper map projection to ODOT, Ohio Geographically Referenced Information Program (OGRIP) and the Counties. As a key component of this work, DDTI will create a state-wide GIS data store that will support Ohio's 2019 NG9-1-1 implementation providing improved emergency services for 11.6 million people and 235 PSAPs.

2.3.12 Experience Serving Similar Clients

Commonwealth of Massachusetts

Project Description

The Commonwealth of Massachusetts was one of the first states to deploy an i3 compliant NG9-1-1 system and currently geospatially routes all calls to 9-1-1 (ALI has been replaced with an LDB with land line records in CLDXF format and LVF validated).

As a subcontractor to General Dynamic Information Systems (acquired by Comtech), DDTI worked collaboratively with MassGIS to normalize all GIS data to be used within the NG 9-1-1 system. We provided both mandatory and optional/recommended GIS datasets required for implementation and all required schemas and data structures. DDTI worked with MassGIS to develop extract, transform and load routines to populate system tables from existing datasets.

DDTI provided quality assurance and control services to include review of the following:

- Missing data layers
- Missing attribute information
- Standardization of GIS data attributes in adherence to relevant national standards, both centerline and site/structure location points following the FGDC-STD-016-2011, NENA GIS Data Model, NENA Site Structure Address Point
- Synchronization of GIS data with MSAG and ALI (NENA 71-501 v1). Address range parity in centerline, as well as relating to site/structure location points and centerline
- Duplicate address ranges
- Direction and flow errors
- Gaps and overlaps in PSAP and service boundaries and edge matching
- Centerline breaks at intersections and boundaries

In addition, DDTI continues to work with MassGIS to develop a strategy to ensure timely and accurate local input of address information and any other changes to the key datasets required for Next Generation 911 operation.

DDTI has deployed ECRF/LVF, DataManager for GIS quality assurance and publishing, Location Database (LDB) and associated services and 819 seats of tactical map display software (ResponseAssist). This software operates with 99.999% availability and supports over 6.8 million citizens in Massachusetts.

National Capital Region

Project Description

DDTI was contracted to assist the National Capital Region (NCR) create a regional NG9-1-1 ready GIS dataset. The NCR encompasses 16 jurisdictions (City of Alexandria VA, Arlington VA, Fairfax VA, City of Falls Church VA, Fauquier VA, Loudoun VA, City of Manassas VA, City of Manassas Park VA, Prince William VA, Stafford VA, Charles MD, Frederick MD, Montgomery MD, Prince Georges MD, Metropolitan Washington Airports Authority (MWAA), and Washington DC), with a combined population of over 5.5 million.

DDTI met with each jurisdiction and analyzed each field in their GIS road centerline and address layers to determine which fields would be mapped to the NG9-1-1 dataset. If mandatory data needed for NG9-1-1 was not represented in the jurisdiction's GIS, DDTI worked with the client in the development of that data. DDTI provided a file transfer service where jurisdictions could upload their data. This data was compared to the MSAG/ALI and discrepancy reports produced. Accounts were set up in ArcMap where each jurisdiction could easily access these discrepancy reports and make the necessary corrections. Through multiple iterations, a refined regional GIS dataset was created that would seamlessly fit into a NG9-1-1 system.

The State of California

Project Description

DDTI provided support to assist the State of California to produce statewide GIS layers as defined in the NENA Standard for NG9-1-1 GIS Data Model (NENA-STA-006.1-2018) with the goal of providing geospatial locations for all existing ALI records.

Data inputs for all 58 counties were acquired, including ALI and MSAG records, as well as the GIS Road, and Polygon (ESB) layers. The data inputs were loaded into the appropriate GIS software solution and related databases. A series of tests were performed on the data and the results presented to the MSAG Authority for review and corrections. This was an iterative process of testing and remediation will ensure that the data is suitable to locate geospatial locations for all ALI records.

Upon completion of all final edits and location determinations, DDTI evaluated and populated as many applicable fields as possible with the provided data to meet the NENA Standard for NG9-1-1 GIS Data Model (NENA-STA-006.1-2018). Missing fields and data deficiencies were reported back to the MSAG Authority.

The State of Montana

Project Description

DDTI was selected by Montana to perform a statewide data assessment analysis providing information and guidance to 58 local entities (PSAPs) for the remediation of their data. This included ALI modifications, MSAG updates and correction of streets, boundaries and address points. DDTI's verified the completeness of the attribute information gathered and identified areas needing remediation.

Appendix 2 - ALI System Replacement – MSAG Conversion Service (MCS) and Location Database (LDB)

MSAG Conversion Service (MCS)

The MCS is designed to bridge the gap between legacy (ALI/MSAG) and Next Generation (PIDF-LO/CLDXF) data schemas and formats. Depending on the approach taken to transition from E9-1-1 to NG9-1-1, an MCS may be required.

In the situation where the legacy ALI database is to be retained, the MCS provides two services. The first allows Service Providers to translate their ALI records into PIDF-LO so they can be pre-validated against the Location Validation Function (LVF). Second, and more importantly, the MCS provides the translation of address data during 9-1-1 call flow. The Legacy Network Gateway (or other NG core functional element) will retrieve an ALI record for each call it processes, in turn it needs to convert this ALI record to PIDF-LO so that it can successfully query the ECRF to determine call routing. Note that in this situation, a Location Database as described in the following paragraph, is not required.

In the situation where the legacy ALI database is wholly replaced by a transitional Location Database (LDB), the MCS is used by the Service Order Input (SOI) process to convert the legacy address records submitted by the service providers to the NG9-1-1 CLDXF format. The LDB stores all records in CLDXF format and is therefore closely aligned with the data in the ECRF/LVF.

Without the MCS (or similar process), location data associated with each call will not be aligned with the GIS data that is in the ECRF/LVF, as this data is required to be in the NG9-1-1 GIS Data Model (which is closely aligned with CLDXF, and very different from legacy ALI/MSAG data models). Failure to align call location data with ECRF/LVF data will result in significant call routing issues.

Additionally, the MCS can provide translation services to gateway elements when calls need to be transferred with location between legacy and NG PSAP's.

Location Database (LDB)

Overview

A Location Database (LDB) serves as both a legacy ALI database and as a LIS in an i3 NG9-1-1 environment and is included in this response to fully replace the existing ALI database and enable smooth transition to NG9-1-1.

During the transition to full NENA i3, location must be supported for legacy wireline, wireless and VoIP calls. Currently the ALI database is used in E9-1-1 networks to provide this data. Using the ALI database in an i3 environment presents numerous challenges.

Typically, the quality of the data in the ALI database is insufficient for ECRF based call routing, and the response times of ALI queries often involve too much latency. To properly steer a 9-1-1 call in i3, it is essential that location data is pre-validated against the LVF. Most ALI databases at present are not well synchronized with the GIS data, and ALI database providers have no mechanisms or processes in place to perform LVF validation and to fix the errors. It is also critical to note that location must be available early in the call flow (unlike E9-1-1, where the ALI database is not queried for location until the call is already at the call handling equipment). The call cannot be properly steered through the i3 functional elements until location is available. This makes it critical that at least coarse location information is available in milliseconds, not the 2-5 seconds it can take to query a typical hosted ALI database.

Additionally, a legacy ALI system uses a legacy data format that is not compatible with the new NG9-1-1 data models. Data in the LVF is required to be in the NG9-1-1 GIS Data Model, which is significantly different from the legacy MSAG and ALI data models. As an example, a street in a legacy MSAG data model might be "N MAIN ST, SALT LAKE CITY", but in the NG9-1-1 GIS Data Model, and thus the LVF, this street would be represented as "NORTH MAIN STREET, SALT LAKE CITY". If the legacy MSAG address for this street was submitted to the LVF for validation, it would fail. For this reason, the LDB stores all civic address location data in the NG9-1-1 format. As all service providers are still likely to submit their subscriber's locations in the legacy format, the NENA i3 standard introduces a functional element called a MSAG Conversion Service, or MCS, to convert data between the legacy and NG9-1-1 formats.

To overcome the problems of legacy ALI systems, NENA recommends the use of the Location Interwork Function, or LIF, within the Legacy Network Gateway, utilizing an internal location database with steering data as needed. This database is often referred to as an LDB, or Location Database (NENA-INF-008.2-2014). The LIF is a part of the LNG, although it can be physically separated.

The LDB can provide the same functionality as a legacy ALI database, but also provides i3 processes and interfaces. A single state-wide LDB would provide numerous advantages over the current ALI database system, including:

- All location records that contain a civic address are pre-validated against the LVF, ensuring that at the time of a 9-1-1 call they will properly route.
- LDB response times are measured in milliseconds, not seconds (note that for wireless and nomadic VoIP, the LDB must still communicate with MPC/VPC which will introduce delay).
- Service providers would not have to change their workflows, as the LDB supports the legacy SOI provisioning interfaces. Service providers can continue to send their records in this legacy format, and the MCS will be used to convert the record into the NG9-1-1 data model before provisioning the data into the LDB. This means that legacy service providers can continue "business as usual", without having to change their existing processes.
- All data would be stored in NG9-1-1 formats.

- A legacy MSAG, at the state level, can still be created for service providers that wish to use it. The MSAG is generated from data in the ECRF/LVF and converted into a legacy format using the MCS.

The LDB retains the current information, functionality, and interfaces of today's ALI, but also can utilize the new protocols required in an NG9-1-1 deployment. The LDB supports the protocols for legacy ALI query, the protocols required to obtain information for wireless calls by querying the mobile positioning center (MPC) or gateway mobile location center (GMLC), and the protocols required for i3 location information retrieval and conveyance, such as HTTP-Enabled Location Delivery (HELD).

Carrier Provisioning of the Location Database

The LDB location data is maintained via the continued use of Service Order Input (SOI) processing. The LDB SOI processing supports both NENA 2.1 and NENA 4.0 formats, as well as custom service provider specific formats. When used in conjunction with the MSAG Conversion Service (MCS) and Location Validation Function (LVF), the LDB translates (from the legacy format) and validates all records in a SOI file before committing the changes to the database. In the event of validation failure, a SOI error record is created and returned to the service provider, as well as the agency responsible for the maintenance of the GIS data used in the LVF. In this regard, the LVF replaces the function of the MSAG used in legacy E9-1-1 systems.

LDB Manager

The LDB allows unprecedented access into the location data for authorized users via a secure web interface called LDB Manager NXG. Carriers will have full access to their records.



Record Search

Device ID	Status	
<input type="text"/>	<input type="text" value="Locked"/>	
Service Provider Choose Clear	Customer	
<input type="text"/>	<input type="text"/>	
House Number (HNO) Start	House Number (HNO) End	Street Name (RD)
<input type="text"/>	<input type="text"/>	<input type="text"/>
Community (A3/PCN/COMM)	State (AT)	Zip Code (PC)
<input type="text"/>	<input type="text"/>	<input type="text"/>
<input type="button" value="new"/>	<input type="button" value="search"/>	<input type="button" value="reset"/>

Key functionality of the LDB Manager NXG web interface includes:

- Role based security, restricting users to what they can do and what data they can see. For example, a service provider will only be allowed to view their location records and job reports from SOI jobs they have submitted.
- Ability to query data by telephone number, customer name, address and status.
- Ability to modify location records and validate the changes against the LVF in real time.
- View and download reports and data extracts.
- Workflow for resolving data discrepancies for records that have failed LVF validation (for example, if, after review, the service provider has determined that the location data is correct, the discrepancy can be routed to the appropriate GIS department for resolution).
- Full pANI and E2+ management.
- No Record Found (NRF) workflow.
- SOI job and record management.
- NPAC integration for managing Local Number Portability (LNP).
- Support for IETF ECRIT Additional Data on each record.

Discrepancy Workflow

Unlike legacy systems, civic addresses in NG9-1-1 are pre-validated against the LVF. In the event a civic address submitted by a service provider fails LVF validation, a discrepancy is created in the LDB and a workflow is initiated to resolve the issue. LVF validation can fail for one of three reasons:

1. The address submitted by the service provider is not valid.
2. The address was incorrectly translated into the NG9-1-1 format by the MCS.
3. The address is missing from the GIS data (i.e., it is not in the LVF).

When a record fails LVF validation, it is initially assigned to either the service provider that owns the record (based on the telephone number), or to the GIS user(s) that are responsible for the authoritative GIS data in the LVF. Users are expected to review the reasons for LVF validation and either make a fix to the data or to reassign the discrepancy to another group. For example, a discrepancy might be assigned to a service provider, who, after review, decides that they feel the address is valid, so they assign it to the GIS user(s) responsible for the GIS data in the LVF. The service provider must add comments to the discrepancy to help the GIS user resolve the discrepancy. If the GIS user can fix the data, that will be reflected in the LVF and the record will become valid and the discrepancy will be closed. If service providers and GIS users cannot agree on how the data should be fixed, it can be assigned to a Discrepancy Arbitrator user for resolution.

Call Flow when using an LDB

It is important to understand call flow and how the LDB fits in when processing legacy 9-1-1 calls. The following section describes the role of the LDB for both wireline and wireless 9-1-1 calls.

Legacy Wireline Call

When a person dials 9-1-1 from a wireline device, the call will be delivered to the 9-1-1 network Legacy Network Gateway or converted to SIP by the service provider and delivered over IP. In either case, location information for the wireline call will need to be determined. If the service provider chooses to deliver the call over SIP, it is their responsibility to provide a LVF valid location with the call.

During the transition period to Next Generation 9-1-1, the LDB will be hosted and supported by the 9-1-1 authority, much like traditional ALI systems are today. The LDB will provide near identical functionality to traditional ALI systems. It is expected that the service provider delivering the wireline 9-1-1 call will provision the LDB, using the SOI interface, with the phone number (TN) and civic address of the wireline subscriber. Alternatively, providers can manually edit their own records using the LDB Manager web interface. The LDB Manager web interface provides secure access to the LDB database for service providers to access their own records.

When the wireline 9-1-1 call reaches the Legacy Network Gateway (LNG) it will contain the wireline subscriber's telephone number, or ANI. The LNG or other device requiring location will then query its provisioned LDB server via the LIF, using the HELD protocol, for the civic address of the caller. The

returned civic address will be subsequently used in the call flow to query the Emergency Call Routing Function (ECRF) in order to route the call to the appropriate PSAP.

Legacy Wireless/VoIP Call

When a person dials 9-1-1 from a wireless device, such as a mobile phone, it will be delivered to the 9-1-1 network Legacy Network Gateway or converted to SIP and delivered over IP. In either case, location information for the wireless call will need to be determined. If the service provider chooses to deliver the call over SIP, it is their responsibility to provide a LVF valid location with the call.

It is expected that the LDB will be configured with one or more connections to the appropriate Mobile/VoIP Positioning Centers (MPC/VPC) in order to obtain a refined location (equivalent of wireless phase II location data). When the wireless 9-1-1 call reaches the Legacy Network Gateway (LNG) it will contain a unique identifier (based on the originating cell tower and sector) in the form of either an Emergency Service Routing Key (ESRK) or a combination of an Emergency Service Routing Digits (ESRD) and Callback Number. The LNG or other i3 component that may need location information (for example, the CPE may query the LDB directly for location rebid information), constructs a HELD query and sends this to the LDB. Based on the information in the HELD query, the LDB constructs an E2 query to request location information from the MPC/VPC. It is likely, based on current technology, that the E2 query will be slow. In that case, the LDB will send the LNG the location of the cell tower as an initial response. Once a response is received from the MPC, the LDB will provide the “phase II” location data for any subsequent location requests or location dereference requests. However, the LNG will use the initial returned location to query the Emergency Call Routing Function (ECRF) in order to route the call to the appropriate PSAP in a timely manner.

The LDB must be properly provisioned with steering data. This steering data includes pANI information and details the MPC connection that is responsible for handling this pANI. This steering data is configured using the LDB Manager web interface.

LDB and Legacy PSAPs

Not all PSAPs will transition to being i3 capable at the same time. As a result, the LDB will provide legacy ALI style services to these PSAPs until such time as the PSAP is able to consume PIDF-LO style data.

Additional Data

The LDB can also act as an Additional Data Repository (ADR) as defined in NENA-STA-010.2. When responding to a location request, either by value or by reference, the LDB will include available additional data blocks inside the <provided-by> element of the PIDF-LO. The additional data blocks conform to the IETF ECRIT Additional Data Related to an Emergency Call standard, and may include:

- Data Provider Information
- Service Information

- Device Information
- Owner/Subscriber Information
- Comments

Clients can retrieve the additional data by performing a dereference query to the LDB using the URI received in the initial location response.

Appendix 3 – Business Continuity Plan



Digital Data Technologies, Inc. Business Continuity Plan

Version 1.4

Contents

1. INTRODUCTION.....	4
a. PLAN SCOPE & APPLICABILITY	4
b. PLAN OBJECTIVES.....	4
c. PLAN ASSUMPTIONS.....	4
2. RISK ASSESSMENT.....	5
3. CRITICAL BUSINESS FUNCTIONS.....	7
4. PLAN ACTIVATION AND COMMUNICATION PROCEDURES	8
a. PLAN ACTIVATION DURING NORMAL BUSINESS HOURS.....	8
b. PLAN ACTIVATION OUTSIDE NORMAL BUSINESS HOURS.....	8
c. ACTIONS UPON ACTIVATION.....	8
d. INTERNAL COMMUNICATION PROCEDURES.....	8
5. RESUMPTION STRATEGIES.....	9
a. ALTERNATE SITE / RECIPROCAL AGREEMENT	9
b. BUSINESS FUNCTION RESUMPTION	10
6. EMPLOYEE CONTACT LIST	12
7. VENDOR CONTACT LIST	13
8. FAMILY EMERGENCY PLAN	13

Document Change Control

Date	Change/Review
2013-05-14	Initial Creation - ██████████
2013-05-22	Yearly review - ██████████
2014-06-10	Yearly review - ██████████
2015-06-02	Yearly review - ██████████
2016-05-31	Yearly review - ██████████
2017-05-30	Yearly review - ██████████
2018-05-29	Yearly review - ██████████

Immediate Action Checklist:

Action
Take immediate steps to protect health and safety of self and employees
Evacuate building if necessary (take personal belongings, laptops, pagers, and cell phones, if possible)
Follow emergency procedures and/or instructions from emergency officials
Perform assessment <ol style="list-style-type: none"> 1. Employees Work In Progress 2. Future Deadlines 3. Records and Technology 4. Relocation Strategy 5. Customers, Vendors, and Internal Dependencies
Develop Action Plan – based on the timeline of < 4 hours, 1 day, 2 days, 3 days, 1 week, 2 weeks, > 2 weeks
Contact Critical Dependencies <ol style="list-style-type: none"> 1. Employees 2. Customers 3. Vendors
Activate Business Continuity Plan as required

1 INTRODUCTION

a. PLAN SCOPE & APPLICABILITY

The scope of this plan covers Digital Data Technologies, Inc. (DDTI) The plan should be applicable in the event that a facility is physically inaccessible. It should also respond to regional interruptions to the area.

b. PLAN OBJECTIVES

The DDTI BCP objective is to facilitate the resumption of the critical operations, functions, and technology in a timely and organized manner so that DDTI can continue as a viable and stable organization.

The primary objectives of the plan are to:

- Maintain Key Operations
 - Most critical departments/business functions
- Employees Must Be Able to Access Alternate Facility
 - Ensure that employees have safe access to facility

c. PLAN ASSUMPTIONS

The following assumptions were used while creating this plan:

- An event has occurred that affects your normal operations.
- There is no access to the affected facility.
- All documents and equipment within the facility are inaccessible and may be permanently lost.
- Qualified personnel are available to continue operations.

2. RISK ASSESSMENT

Hazard	Probability	Magnitude	Warning	Duration	Risk Priority
Flooding	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low
Coastal Hazards (e.g., Hurricane Tsunami Tropical Storms Nor'Easter)	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Thunderstorms/ Lightning/Hail	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Tornado	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low
Winter Storms/ Ice Storms	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input checked="" type="checkbox"/> Medium <input type="checkbox"/> Low
Human Caused (Civil Unrest/ Terrorism)	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
High Winds	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Wildfire	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Landslide	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Earthquake	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> Low <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low

Based off 2011 MEMA hazard identification risk assessment and Risk Assessment Calculation

**Note: the impact and duration of hazards for your business may differ from this table.*

Hazard	Probability	Magnitude	Warning	Duration	Risk Priority
Disgruntled Employee Action	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Technological Attack	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Hardware Failure	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Building Fire	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Bomb Threat	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Power Outage	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Human Error	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
	4. Highly Likely 3. Likely 2. Possible 1. Unlikely	4. Catastrophic 3. Critical 2. Limited 1. Negligible	4. Minimal 3. 6 – 12 hrs. 2. 12 – 24 hrs. 1. 24+ hrs.	4. 12+ hrs. 3. 6 – 12 hrs. 2. 3 – 6 hrs. 1. < 3 hrs.	<input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low

3. CRITICAL BUSINESS FUNCTIONS

Critical Business Functions are the responsibilities and tasks that need to be completed in order to consider your business as operational.

#	Function	Urgency	Maximum Downtime	Minimum Required Resources	Brief Process to Complete Function
1	Support	High	24 Hours	# Employees: Equipment: Workstation Supplies: N/A Technology: Workstation, Phone, Internet Interdependencies: System Admin	Answer customer calls and attempt to remedy issues as best as possible.
2	Operations	Medium	1 Week	# Employees: Equipment: Workstation Supplies: N/A Technology: Full operational system Interdependencies: System Admin	Test needed components and resume normal function.
3	System Admin	High	12 Hours	# Employees: Equipment: Workstation Supplies: Replacement hardware Technology: Phone, Internet, Infrastructure Interdependencies: None	Identify and remedy issue. Notify employees of system status.
4	Development	Low	1 Week	# Employees: Equipment: Workstation Supplies: N/A Technology: Full operational system Interdependencies: System Admin	Test needed components and resume normal function.
5	Administration	Low	72 Hours	# Employees: Equipment: Workstation Supplies: QuickBooks, Scanner, Printer Technology: Workstation, Phone, Internet Interdependencies: System Admin	Corporate Accounting and Payroll

4. PLAN ACTIVATION AND COMMUNICATION PROCEDURES

The Business Partners will declare a crisis and initiate the implementation of the BCP.

a. PLAN ACTIVATION DURING NORMAL BUSINESS HOURS

If a crisis occurs during working hours, it may be necessary for all personnel at the facility to evacuate the building. In this case, all employees should exit the building at the appropriately marked “EXIT” signs and proceed to the primary assembly point. If applicable, the last employee should check that the door they are exiting is locked and arm the security system if it is safe to do so.

Personnel should remain at the primary assembly point (West Parking Lot) until a determination is made whether or not a crisis declaration will be made.

Once at the assembly point, Initiate headcount and make note of missing and / or injured employees. Report missing and / or injured employees to the Business Partners or Management team.

If it is determined that the facility cannot be re-entered, the Management Team will inform personnel what to do. The employees may be instructed to go home to await further instructions or to activate the BCP. Further communications, such as instructions on where and when to report for work will be performed utilizing the communication procedures detailed below.

b. PLAN ACTIVATION OUTSIDE NORMAL BUSINESS HOURS

If a crisis occurs outside normal business hours, the Business Partners will activate the BCP using the communication procedures detailed below.

c. ACTIONS UPON ACTIVATION

Upon activation of the BCP, the Business Partners will be responsible for notifying the employees of remote work procedures.

d. INTERNAL COMMUNICATION PROCEDURES

Business Partners should determine the best methods for disseminating communications to staff. See section 6, Employee Contact List.

Employee Communication Methods	
1	Email
2	Phone
3	Text

5. RESUMPTION STRATEGIES

- Resume business functions in priority sequence based upon the classification and criticality of the function.
- Purchase and acquire equipment, supplies and travel arrangements needed for the resumption effort.
- Temporarily eliminate non-critical functions, as necessary, to support the resumption efforts.

a. ALTERNATE SITE / RECIPROCAL AGREEMENT

In the event a crisis destroys the facility or prevents access to the facility, business operations may be transferred to home, or an alternate site, as appropriate.

In the event a crisis destroys the facility or prevents access to the facility, business operations may be temporarily relocated to a business partner providing space for our employees.

#	Site	Contact Information	Alternate / Reciprocal
1	Work from home	N/A	N/A
2	██████████	██████████	
3			
4			

b. BUSINESS FUNCTION RESUMPTION

#	Function	Required Resources	Resumption Procedures
1	Support	Workstation, Phone, Internet	<ol style="list-style-type: none"> 1) Redirect business phone number to mobile or home phone (or group) of employee(s). 2) Ensure employee has access to a workstation or laptop that can be used from home. 3) Support provided on a best-effort basis until operations resume. 4) Begin rebuilding office workstations as needed.
2	Operations	Workstation	<ol style="list-style-type: none"> 1) Begin rebuilding workstations as needed. 2) If needed, provide employees with temporary laptop or workstation to work from home. 3) Restore access to required resources.
3	System Admin	Replacement equipment	<ol style="list-style-type: none"> 1) Acquire workstation or laptop. 2) Assess replacement hardware needs and begin procurement process. 3) Assess data recovery needs. 4) Build or recover system infrastructure. (Network, Servers, Storage, Internet access, Workstations, etc.) 5) Recover or rebuild Active Directory. 6) Restore data from backup. 7) Restore critical systems: <ol style="list-style-type: none"> a. Certification Authority b. SQL Server c. Quickbooks d. TFS e. File Server f. PBX g. WDS h. ADSync i. Licensing Server j. Build Server/CI 8) Ensure remote access for employees.
4	Development	Workstation, SQL, TFS, Build Server/CI	<ol style="list-style-type: none"> 1) Begin rebuilding workstations as needed. 2) If needed, provide employees with temporary laptop or workstation to work from home. 3) Restore access to required resources.
5	Administration Business Development	Workstation, Quickbooks, Printer, Scanner	<ol style="list-style-type: none"> 1) Begin rebuilding workstations as needed. 2) If needed, provide employees with temporary laptop or workstation to work from home. 3) Restore access to required resources.

6. EMPLOYEE CONTACT LIST

Employee Name	Title / Responsibility (Inc. Succession)	Home Number Cell Number	Email Address
[REDACTED]	CEO/Partner	H. M. [REDACTED]	[REDACTED]
[REDACTED] x	COO/Partner	M. [REDACTED]	[REDACTED]
[REDACTED]	System Admin/Partner	M. [REDACTED]	[REDACTED]
[REDACTED]	Software Developer/Partner	H. M. [REDACTED]	[REDACTED]
[REDACTED] x	CIO	M. [REDACTED]	[REDACTED]
[REDACTED]	Chief Business Development Officer	M. [REDACTED]	[REDACTED]
[REDACTED]	Director of Technology	M. [REDACTED]	[REDACTED]
[REDACTED]	Director of Operations	M. [REDACTED]	[REDACTED]
[REDACTED]	Accounting and Administration	H. M. [REDACTED]	[REDACTED]
[REDACTED]	Corporate Administration	H. M. [REDACTED]	[REDACTED]
[REDACTED]	Systems Engineer	M. [REDACTED]	[REDACTED]
[REDACTED]	Support Coordinator	M. [REDACTED]	[REDACTED]
[REDACTED]	Support Coordinator	M. [REDACTED]	[REDACTED]
[REDACTED]	Database Admin	M. [REDACTED]	[REDACTED]
[REDACTED]	LDB Coordinator	M. [REDACTED]	[REDACTED]
[REDACTED]	Development Lead	M. [REDACTED]	[REDACTED]
[REDACTED]	Development Lead	M. [REDACTED]	[REDACTED]
[REDACTED]	GIS Coordinator	M. [REDACTED]	[REDACTED]
[REDACTED] x	Project Manager	H. M. [REDACTED]	[REDACTED]
[REDACTED] x	Implementation Coordinator	M. [REDACTED]	[REDACTED]
[REDACTED]	GIS Coordinator	M. [REDACTED]	[REDACTED]
[REDACTED]	Product Owner	H. M. [REDACTED]	[REDACTED]
[REDACTED]	Product Owner	M. [REDACTED]	[REDACTED]
[REDACTED]	Support	M. [REDACTED]	[REDACTED]
[REDACTED]	Support	M. [REDACTED]	[REDACTED]
Additional employee contact information on Office 365			

7. VENDOR CONTACT LIST

Vendor	Resource/Service	Contact Information
[REDACTED]	Building Management	[REDACTED]
[REDACTED]	Insurance	[REDACTED]
[REDACTED]	Payroll Processor	[REDACTED]
[REDACTED]	Bank	[REDACTED]
[REDACTED]	Internet Service Provider	[REDACTED] x
[REDACTED]	Internet Service Provider	[REDACTED]
[REDACTED]	Security System	[REDACTED] x
[REDACTED]	CPA	[REDACTED]
[REDACTED]	Attorney	[REDACTED]
[REDACTED]	Data Center	[REDACTED]
[REDACTED]	HVAC	[REDACTED]
[REDACTED] x	Software Licensing	[REDACTED]
[REDACTED]	Software Licensing	[REDACTED]
[REDACTED]	Hardware Vendor	[REDACTED]
[REDACTED]	Worker's Compensation	[REDACTED]
[REDACTED] x	Employee Medical Insurance	[REDACTED]
[REDACTED]	Employee Dental Insurance	[REDACTED] x
[REDACTED]	Employee Vision Insurance	[REDACTED]
[REDACTED]	Employee Life & Disability Insurance	[REDACTED]
[REDACTED]	401k	[REDACTED]
[REDACTED]	Police	[REDACTED]
[REDACTED]	Fire	[REDACTED]

8. FAMILY EMERGENCY PLAN

Many large-scale events (e.g., hurricanes, earthquakes, regional black-outs, transit strikes or a pandemic) can impact the families, homes and lives of employees outside of the workplace as well as the business itself.

In order to improve the safety and security of employees and their families, they need to get prepared for events that could impact them. Every DDTI employee's family should consider taking several basic steps to protect their loved ones, homes, automobiles and possessions when an emergency strikes.

Every household should have their own "emergency plan" that may include:

- Having a home evacuation and reunification plan that every member of the family memorizes (this might include a reliable means of evacuating the first or second floor during fires and practicing the evacuation plan of the apartment building)
- Having a pre-determined location to meet in the neighborhood should the family have to leave their home
- Having a contact list of all emergency telephone numbers and web sites
- Keeping flammable or hazardous substances – and potentially dangerous objects like tools, equipment or firearms - properly stored, secured, and located out of the reach of children and pets
- Identifying a list of safety practices, such as keeping doors, windows and garages locked

Emergency supplies for each household include:

- Fire extinguishers near the kitchen, workshop, basement and garage
- A family emergency "Go Kit" which should contain supplies, food, medications, and other materials for several days of "survival" if sheltering or evacuation are required by city or county emergency authorities

Following are some websites that will provide additional resources:

- American Red Cross Planning Power Tool: <http://arcbrcr.org/>
- American Red Cross Master of Disaster Children / Family Disaster Education Kit: <http://www.redcross.org/prepare/location/school/preparedness-education>
- Center for Disease Control Emergency Planning Guide: <http://emergency.cdc.gov/preparedness/>
- FEMA Emergency Planning Tips: <http://www.ready.gov/make-a-plan>
- Stanford University Disaster Preparedness Information: <http://med.stanford.edu/somsafety/forms/EP Home>.

Appendix 5 – Corporate Resolution

DIGITAL DATA TECHNOLOGIES, INC.

Action of Directors
Without a Meeting

Pursuant to Section 1701.54, Ohio Revised Code, the undersigned, being all of the directors of Digital Data Technologies, Inc., an Ohio corporation ("Corporation"), hereby adopt, as of 11:00 AM on February 5, 2020 and by this written action in lieu of a meeting, the following resolutions with the same force and effect as if they had been unanimously adopted at a duly convened meeting of the directors of the Corporation:

RESOLVED, that the following persons have been elected to serve as officers of the Corporation for the term provided by, and in accordance with, the Regulations of Digital Data Technologies, Inc. Shareholders Agreement:

<u>Name</u>	<u>Office</u>
Ron Cramer	President
Mark Wilcoxon	Secretary and Treasurer
Gabor Blaho	Vice-President
Christopher Santer	Vice-President

FURTHER RESOLVED, that the President be, and hereby is, authorized to execute and deliver any and all contracts committing the Corporation to perform any and all services, obligations and other undertakings;

FURTHER RESOLVED, that each of the officers of the Corporation be, and hereby are, authorized and directed to do any and all acts or things, and execute, acknowledge, file or deliver as may be necessary or appropriate, any and all certificates, instruments, agreements, or other documents necessary or appropriate to carry out such contracts and the transactions contemplated thereby.



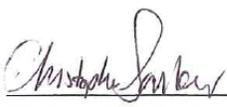
Ron Cramer



Mark Wilcoxon



Gabor Blaho



Christopher Santer

Appendix 6 – Cost Analysis

DDTI Spatial Interface Software

	Cost per Person per Month	Estimated Population	Monthly Fees
DataManager (Spatial Interface)	\$0.004167	4,888,000	\$20,368.30

- Software is priced as a monthly usage fee based on population.
- It is anticipated that the ability to geospatially route cellular emergency calls can be available for all PSAPs relatively quickly once PSAP polygons have been defined (Phase 1). DDTI anticipates the SI will be operational a by August of 2020 (5 months of fees in year 1).
- Installation/conversion/integration/transition costs are based on resource hours at \$110 per hour and include installation of DDTI software, coordination with INdigital and any required ECRF/LVF interfaces (total cost of \$66,000).
- DDTI anticipates INdigital may need to add database software to support the addition of DDTI's SI software. This is estimated to be \$50,000 and is listed under the 3rd party software category.

The following items are included in the usage fees and do not require additional cost:

- Technical and user documentation
- Maintenance costs
- Existing software upgrade/integration/training
- Revisions to documentation
- New functionality compared to prior available functionality in the market
- Technical support/customer service, per year
- Unlimited phone technical support for the technical staff

It should be noted that there are no specific categories for non-recurring costs under the Annual Price section of the Cost Proposal Template (Schedule C). These would total \$116,000 in year 1 as described above.

DDTI Data Normalization

	Cost per Person	Estimated Population	Total
Data Normalization Fees	\$0.08	4,888,000	\$439,920

- Data Normalization is estimated to take up two years to complete. Costs were evenly divided between Year 1 and Year 2 (\$219,960 per year) under the QA/QC category.
- There are no ongoing fees associated with this category because this function will be fulfilled by DDTI's DataManager product once data normalization is complete (i.e., there are no ongoing costs for geodatabase management because the PSAPs will directly provide updates that will be published to the ECRF/LVF following QA/QC tests performed by the DataManager product).

Location Database (OPTIONAL)

	Cost per Person	Estimated Population	Annual Fees	Monthly Fees
Location Database (LDB)	\$0.14	4,888,000	\$684,320.00	\$57,026.67

*Note: includes LDB services and MSAG
Conversion Service (MCS) software*

- Software installation and Service Provider onboarding would be \$75,000 when the LDB is selected.
- There may be a need for additional hardware to support the LDB, but DDTI will need to evaluate the current environment to determine if this would be necessary.