



# PROPOSAL FOR TAX PARCEL MAP PROJECT FOR THE TOWN OF DURHAM, NEW HAMPSHIRE

Submitted April 5, 2019 by



11 Pleasant Street, Littleton, NH 03561

P (603) 444-6768 / (800) 322-4540

[cai-tech.com](http://cai-tech.com)

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## PROPOSAL SUBMISSION

*Note: Please return this page as a cover sheet with each copy of your submittal.*

The undersigned, an authorized agent of his/her company, hereby certifies:

- (X) familiarization with all terms, conditions, and specifications herein stated;
- (X) vendor is qualified to perform work and services as included;
- (X) That the pricing contained in this submittal is valid until July 5, 2019.

Respectfully submitted \_\_\_\_\_



Authorized Signature

Cartographic Associates Inc.

dba CAI Technologies

Company Name

Timothy Fountain, GISP

Printed Name of Individual Signing Proposal

11 Pleasant Street

Address 1

Vice President

Title

Address 2

800-322-4540 x 16

Telephone

Littleton, New Hampshire 03561

City, State and Zip Code

603-444-1366

Fax Number

April 5, 2019

Date Submitted

tfountain@cai-tech.com

E-Mail Address

*Person signing proposal must be a person in your company authorized to sign a contract with the Town of Durham.*

- We are not submitting a proposal for this project, however, please retain our company information listed above in your vendor database and continue to send us bids and proposals in the future.

# LETTER OF TRANSMITTAL

Cartographic Associates, Inc.  
dba CAI Technologies  
11 Pleasant Street, Littleton, NH 03561  
Tel: 800-322-4540 Fax: 603-444-1366  
cai-tech.com




The undersigned proposer acknowledges and accepts that all the terms and conditions set forth in this proposal are mandatory and agrees that they will be included in their entirety in any contract resulting from this proposal.

Cartographic Associates, Inc. warrants and certifies that the individual signing this proposal is a bona fide employee of the firm and has authority to solicit and secure any agreement resulting from this proposal.

The proposal price has been arrived at independently, without collusion, consultation, or communication as to any other proposer or with any competitor. The proposal price was not disclosed by the proposer and was not knowingly discussed prior to the submission, directly or indirectly, to any other proposer or any other competitor. No attempt was made by the proposer to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

No elected official or appointed official or employee of the Town of Durham shall benefit financially or materially from any contract resulting from this proposal. This proposal shall remain in full force and effect for at least ninety (90) days from the date first shown herein.

PROPOSER:

BY:   
\_\_\_\_\_  
Timothy Fountain, GISP, Vice President  
Contracting Officer

## COVER LETTER

April 5, 2019

Mr. Jim Rice  
Assessor  
Town of Durham  
8 Newmarket Road  
Durham, NH 03824-2898

Dear Mr. Rice:

We are pleased to enclose herewith two sets of identical copies of our Proposal for mapping and GIS services in accordance with the Town's Request for Proposals for the Tax Parcel Map Project. We are confident that you will find our proposal very responsive to your RFP. CAI has no conflicts of interest and guarantees the proposal terms for ninety (90) days.

CAI has made a serious commitment to provide quality services to local, regional and state governments at a reasonable cost since April of 1985, as is evidenced by our ongoing professional relationships with nearly 450 local and regional governments throughout the Eastern United States, including well over one hundred fifty (150) New Hampshire municipalities.

The firm has successfully completed over 180 town-wide parcel mapping projects throughout New England. The majority of these have been remapping projects very similar in scope to the one you are requesting and were made necessary due to a lack of thorough record research and/or a horizontally controlled base map with the original project. CAI has employed the strict standards outlined in our proposal, including the thorough record research, for every municipal wide parcel remapping project we have ever completed. We have a long track record of delivering projects on time, within budget, and to the highest standards.

We would also like to note that if we are selected, all parcel development work on this project would be completed here in New Hampshire. While many of our competitors have been sending work offshore to take advantage of low labor rates, we are proud to say that CAI has never done so for record research parcel mapping projects. We have worked hard to train and retain experienced staff and to develop our procedures, resulting in an efficient and cost effective process. In fact, nearly one half of our staff has fifteen or more years of service with the firm and 80% have been with us for five or more years.

Thank you for this opportunity and we look forward to the possibility of developing a long term, professional relationship with the Town of Durham.

Sincerely,



Tim Fountain, GISP  
Vice President

TF/slr  
Enclosures

## QUALIFICATIONS

Cartographic Associates Inc., dba CAI Technologies (CAI), located at 11 Pleasant Street, Littleton, New Hampshire, is a for-profit Corporation, subchapter S, incorporated in the State of New Hampshire in 1985, and registered to do business in the States of New Hampshire, Maine, Connecticut, Vermont, Massachusetts, Rhode Island, Pennsylvania, New York, New Jersey, Georgia, Mississippi, and Montana. CAI's Federal Id is 02-0387285 and owners are Franco Rossi, Tim Fountain and Sean Fairhurst.

Originally a mapping and survey company, CAI began its move into the GIS arena in 1988. CAI is now a full service mapping and GIS consulting firm that provides high quality services to local, regional and state governments and maintains an ongoing professional relationship with nearly 450 local and regional governments throughout the Eastern United States.

CAI prides itself as an experienced Esri silver tier Business and Cornerstone Partner with an ArcGIS Online Specialty Service Provider designation. CAI offers full service data development & management services, specializing in a multitude of geospatial implementation and solutions services. CAI's direct experience with the most current ESRI software includes the entire ArcGIS technology stack, including Desktop (at all license levels), ArcGIS Server Enterprise (at all license levels), SDE, ArcGIS Online, and SQL Server.

Our firm, and more importantly our individual staff members, have the experience that will assure products and services delivered that are second to none. CAI currently employs 25 professional full time staff, nearly one quarter of which have been employed at CAI for more than 20 years and most having cross training in several areas. Due to this cross training, our staff has experience in multiple disciplines which allows for seven AutoCAD technicians, ten GIS analysts, two GIS technicians, three application developers/programmers, four project mappers, three database technicians, three QA/QC specialists, three project managers, three reprographic technicians, two GPS field data collectors, and three administrative staff. CAI has the qualified staff necessary to handle many projects of differing requirements at any given time, often working on dozens of projects at varying stages within a week. These include municipal-wide mapping, planning map development, annual maintenance for assessors/planning/street numbering mapping systems, software application development and support, browser GIS implementation, data conversion, software installation and training, and GPS data collection/integration. Suffice to say, CAI has the staff resources, experience and qualifications required to deliver project results of nothing but absolute success.

The combination of more than thirty years experience in municipal parcel mapping along with a solid understanding of and experience in successfully implementing GIS technologies in virtually all municipal departments provides us a unique advantage over our competitors. We listen to our clients, understand their needs and implement leading geospatial technologies to provide cost effective solutions.

CAI has completed eight (8) municipal-wide mapping projects in the last 3 years and currently has four (4) under contract. These projects were completed for Keene, Dorchester, and New London, NH; Glover and Moretown, VT; North Haven, ME; and Heath and Petersham, MA. Details on these project references can be found in Appendix B. Please feel free to contact any municipality.

Please note, as required in the Town's RFP, there are Keene, NH sample maps in the Project Examples section at the end of this proposal.

## PROJECT TEAM

CAI will be responsible for the supervision of all phases of work and shall assume single point responsibility for this entire project. CAI's organizational structure employed to manage the project is described below:

1. All project teams at CAI include a principal owner who is ultimately responsible for the successful completion of the project to the client's satisfaction. Additionally, each parcel mapping project team will include a project manager, who will be supported by technically competent, professional project mappers, CAD/GIS technicians, data input personnel, reprographics personnel, and administrative staff.
2. For this project, we have assembled a strong team. Specifically, the principal in charge of project administration (Project Director) will be Mr. Franco Rossi, President. He will write all progress reports and handle other general administrative functions. Further, he will lend his thirty (34) years of experience and expertise to map problems/questions that may arise through the course of the project.
3. Mr. Tim Fountain, GISP, Vice President, with nearly twenty-five (25) years of experience, will be the Principal responsible for day to day project management. He will act as the (Project Manager) liaison with the Town and will coordinate all preliminary work in acquiring and indexing all plans and deeds. He will also manage all internal aspects and functions among various staff members participating in the project. He will be responsible for the record research and parcel compilation functions and public review sessions.
4. Ms. Sandra Butson, QA/QC Coordinator / Senior Project Mapper, will be responsible for record research, parcel compilation and parcel numbering. She will be the day to day contact between the Town and CAI for the project and will be responsible for making certain all QA/QC procedures are followed. Her thirty (30) plus years of experience in all aspects of the parcel mapping process make her an invaluable member of the Project Team. Ms. Butson will also be responsible for supporting the public review sessions and working with various CAI staff on numerous stages of the project.
5. Mr. Donald Butson, Founder, will assist with the record research, parcel compilation and parcel numbering. He will also be a member of the team assisting the public during the public review sessions. His thirty-seven (37) years' experience in the municipal parcel mapping field will be a valuable asset to this project.
6. Mr. Sean Fairhurst, Chief Technology Officer, with greater than twenty (20) years' experience providing local government GIS solutions, will be the Principal responsible for all technology aspects of the project. All application and scripting development services will be provided under Mr. Fairhurst's direction and supervision.
7. Ms. Rhonda Caron, CAD/GIS Analyst, with sixteen (16) years' experience, will be responsible for all area calculations, GIS processing and GIS database linking.
8. Mr. Luke Uhlman, GIS Analyst, with his nineteen years' experience, will assist with GIS processing and QA/QC of GIS data.
9. All database input will be done under the direction and supervision of Ms. Sandra Rossi, Office/Database Manager, more than 27 years of experience.
10. All printing and reprographic work will be done by Ms. Terri Parks, contributing more than 30 years of experience.
11. It is important to note that CAI's owners are actively involved in all aspects of parcel mapping, including original compilation, remapping, and regular on-going map maintenance functions. This is an asset and value unlikely to be offered by any other firm specializing in municipal mapping.

We refer the Town to Appendix A for CAI's organizational chart and staff resumes.

## APPROACH

### PROJECT UNDERSTANDING:

The objective of this project is to generate current, accurate parcel maps and indexes which show the correct size, shape, location, and ownership of every property in the Town. CAI understands that although the maps generated as a result of this proposal may be used for several purposes, the basic intended use is as a tool for property tax assessment purposes. Therefore, although CAI uses several information sources considered to be legal documents (deeds, surveys, etc.), the information generated is not intended to be used for legal descriptions or property conveyance purposes.

CAI thoroughly understands that the major problems with previously prepared parcel maps, which are deemed unacceptable for the uses intended, are generally known to be: 1) The lack of a rigid spatial framework which assures an accurate, common scale throughout the maps, and 2) The lack of careful, diligent record research and the proper reconciliation of that research to the rigid spatial framework. There have been many other problems noted in prior work but, basically, most of them can be traced from the two major reasons as stated.

This proposal will completely cure all of these problems and will result in an accurate, defensible, and complete inventory of every acre in the Town. Additionally, CAI understands that the mapping system proposed herein will be the fundamental basis for the Town's GIS. Accordingly, the methodology and procedures employed on this project will assure the integrity of the GIS's component databases.

### SCOPE OF THE PROJECT

1. Subject to the terms and conditions of these specifications, CAI shall generate digital parcel maps of the entire geographic area of Durham, New Hampshire.
2. The ownership status of each parcel shall be determined as of April 1, 2021, and final maps shall be delivered by December 31, 2021. Our proposal is submitted using a three year phased approach. Year one shall focus on preliminary data gathering, plan inventorying & indexing, and record research. CAI also proposes an optional custom aerial flight, planimetric base map development and orthoimagery which, if selected, will be performed during year one of the project as well. Year two shall focus on the parcel compilation and pilot delivery. Year three shall focus on the parcel composite, parcel numbering, GIS development, area calculations and tax map sheet development and strict quality control procedures. Recognizing CAI is proposing a 3 year project timeframe, we request the Town provide all recorded property conveyance deeds and surveys, in either hard copy or digital, throughout the project timeframe.
3. CAI has successfully completed several municipal wide parcel mapping projects using this approach. Our internal workflows and data management practices are proven to be efficient and successful in delivering high quality, successful results.

### ORTHOIMAGERY BASEMAP

CAI shall use the 2010, 2013 and 2015 color digital 1-foot pixel resolution, 4-band Orthoimagery made available through NH GRANIT. CAI will also consider using more recent imagery if made available from the TOWN.

It is very important to note that CAI has proposed the additional option for the TOWN to purchase custom Spring 2019 custom aerial photography and the development of a 100 scale planimetric basemap for use during this project. CAI strongly recommends the TOWN consider this option for the basemap to support this project. A planimetric base map combined with thorough parcel record research will produce superior results.



## PARCEL INVENTORY/RESEARCH

1. All property boundaries shall be plotted in accordance with accepted, standard professional criteria using a knowledge of surveying, engineering, forestry, photogrammetry, history, real property appraisal, and boundary law.
2. In compiling the maps, CAI shall constantly reconcile the intent of the record conveyance with the physical evidence as shown on the base map, and by ownership possession as claimed by property owners.
3. Further, CAI shall reconcile the compiled parcel boundaries to the assessed area of the subject parcel as shown in the Town's assessment roll.
4. Four sources of information shall be used to inventory and compile the parcel boundary lines.
  - a. Surveys: CAI shall attempt to obtain all available surveys. These shall be acquired from Town, County, and local sources. CAI shall contact local surveyors in order to obtain as many surveys as possible. All property and boundary surveys shall be properly catalogued. All said surveys shall be referenced to the parcel maps in the attribute database.  
To eliminate human plotting error, all surveys shall be adjusted to the exact mapping scale and carefully compiled directly onto the orthoimage (or planimetric, if selected) base map, resulting in an enhancement of the base map.
  - b. Deeds: Upon acquiring access to the Strafford County Registry of Deeds, CAI shall review the latest deed description of each parcel on the assessment roll, and, in some cases shall review prior descriptions in an attempt to acquire a good metes and bounds description of each parcel. All parcels shall be plotted according to their best description, all the while reconciling the intent of the conveyance to available physical evidence, indications of possession, and the assessment roll.
  - c. Photos/Base Map: In those cases where parcels are not surveyed or where deed descriptions are not well described, property line data may be obtained by studying the base map. In many instances, although a parcel may not be surveyed or well described, it may be well defined by physical planimetric features such as stonewalls, fences, roads, streams, and treelines which are visible and identifiable from the photography.
  - d. Parol Evidence: In cases where land is not surveyed, nor well described or defined, CAI may contact the reputed landowner either by email, US mail or by telephone to attempt to accurately pinpoint the boundary lines. This may involve the discovery of physical evidence which will then be pinpointed on the aerial photos and transferred to the base map. CAI staff will not be performing any fieldwork or field property line surveying.
5. Features worth noting as a result of the intensive parcel inventory process include:
  - a. All roads are carefully plotted according to their right of way limits. CAI shall utilize available Town right of way data resources and contact the NH Department of Transportation for state highway right of way layouts. This has several implications, especially for parcel area calculations.
  - b. Since all non-surveyed parcel areas are computed by software, the accurate and correct plotting of parcels is critical. If the boundary line plotting is incorrect, then the resulting computed area will be incorrect and value assessments based on that area will be incorrect.
  - c. The plotting accuracy of a parcel's boundaries is due not only to the diligence and perseverance of the researcher, but also to the cartographer's experience in reconciling all the information correctly, considering the written documentation, the physical evidence, and the intent of all affected parties.

6. Any parcel which cannot be located, plotted, or its ownership determined by CAI using any of the sources listed above, shall be recorded on an errata list along with documentation as to why the parcel made the list. This list shall be delivered to the Town at the completion of the project and in no event shall the number of parcels on the list exceed two (2) percent of the total number of parcels indicated on the maps.
7. CAI wishes to emphasize that all property line compilation work shall be done in a careful and diligent manner by its trained professional staff, experienced in mapping New England communities.
8. This portion of the mapping project, parcel research, inventory, and compilation, is extremely important, and often overlooked or made to seem unimportant by both municipal officials and other mapping consultants. Many people believe that property lines from older, inaccurate maps can be “best-fit” or “rubber sheeted” to the features on a new base map. Without the benefit of the process described herein, that is simply not true. The lack of adequate research and the proper reconciliation of that record information to accurate base maps is exactly why most communities have to re-map when they want to proceed into a GIS environment. Only years after the original, inadequate work was completed, do they realize that it is not appropriate for their real needs.

CAI prides itself on this critical, make or break, stage of the project. Without it, it is doubtful if the complete mapping project will be a success. Recognizing CAI is proposing a 3 year project timeframe, CAI requests the Town provide all recorded property conveyance deeds and surveys, in either hard copy or digital, throughout the project.

## PARCEL MAPS/GRAPHIC DATABASE

### 1. Sheet size and format

- a. Parcel Map sheet size shall be 24" x 36" overall, with a 20" x 30" neat area oriented to the state plane coordinate grid system.
- b. All completed parcel map sheets shall be prepared digitally with the ability to provide additional prints quickly on demand.
- c. Basic map information shall be shown in the border at the bottom of the map sheet and shall include: Title block, delivery date, revision block, legend, north arrow, scale, and index diagram.
- d. When it is necessary to show portions of a single parcel on two or more map sheets, all black and white match lines shall be clearly labeled to facilitate the location of the whole parcel.
- e. Map sheets shall be numbered sequentially in a manner conducive to a smooth flow using the first digit of the map scale as the first digit of the map sheet number.

### 2. Digital Drafting Standards

#### a. Linetypes

CAI has defined a set of linetypes associated with specific entities, i.e. roads, dashed roads, Right of Way, etc. Listed below are the linetypes and the associated layer names.

LINETYPE	LAYER NAME
ML	MATCHLINE
UTILITY	UTILITY
RW	RW
COMMON	COMMON
TOWNLINE	TOWNLINE
WETLAND	WETLAND
DASHED	DASHROAD
CONTEND	CONTEND
TRAIL	TRAIL
CONTINUOUS	ALL OTHERS

b. Text

All text is set to conform to the standard cartographic criteria. Below is a list showing the text size with corresponding scale sizes in feet. These will be set automatically along with the text style, layer, and color when the selection is picked from the menu. If a text height must be reduced, it will be dropped to accommodate the cartographic need. Style commands will be used to keep the same layer and style, avoiding any problems with information being placed in incorrect layers.

Text template size	40	50	100	200	300	400	500	1000
60	2.4	3	6	12	18	24	30	60
80	3.2	4	8	16	24	32	40	80
100	4.0	5	10	20	30	40	50	100
120	4.8	6	12	24	36	48	60	120
140	5.6	7	14	28	42	56	70	140
312	12.5	15.6	31.2	62.8	93.6	124.8	156	312

c. Layers

All data will be put in their own unique and corresponding layer. After picking a layer, it will be set automatically along with the linetype, color, and if needed, text style, and height. It is imperative that each data set be kept on its respective layer. The list below gives the layer name with its associated color, linetype, and blocks, used with it.

Layer Name	Color	Linetype	Blocks	Lisp Routine
ACREAGE	2 (YELLOW)	CONTINUOUS		AC
BGTEST	1 (RED)	CONTINUOUS		
BLOCK	5 (BLUE)	CONTINUOUS		
BLOCKNUM	5 (BLUE)	CONTINUOUS		
BORDER	VARIES	CONTINUOUS	VARIES	
BRIDGE	3 (GREEN)	CONTINUOUS		
BUILDING	1 (RED)	CONTINUOUS		BG
CEMETERY	2 (YELLOW)	CONTINUOUS	CX	
COMMON	2 (YELLOW)	COMMON		CO-TO CHANGE
DAM	1 (RED)	CONTINUOUS		
DASHROAD	4 (CYAN)	DASHED		
DIMENSIONS	3 (GREEN)	CONTINUOUS		DM
DISPUTE	1 (RED)	DISPUTE		
DOCK	1 (RED)	CONTINUOUS		
DONUT	2 (YELLOW)	CONTINUOUS		DO
ELEVPRM	1 (RED)	CONTINUOUS		
ELEVSND	2 (YELLOW)	CONTINUOUS		
EXEMPT	2 (YELLOW)	CONTINUOUS	EXEMPT	
GRASS	2 (YELLOW)	CONTINUOUS	GRASS	
GRID	1 (RED)	CONTINUOUS		
HOOKS	2 (YELLOW)	CONTINUOUS	HOOKS	HO
LOT	7 (WHITE)	CONTINUOUS	LOT	
MATCHLINE	1 (RED)	ML		
MATCHTEXT	2 (YELLOW)	CONTINUOUS		MLH
PARCEL	5 (BLUE)	CONTINUOUS		PIN, PA
PONDNAME	3 (GREEN)	CONTINUOUS		PN
POOL	1 (RED)	CONTINUOUS		
PROPERTYLINE	2 (YELLOW)	CONTINUOUS		PR - TO CHANGE
PT	2 (YELLOW)	CONTINUOUS		
PVTRD	3 (GREEN)	CONTINUOUS		

Layer Name	Color	Linetype	Blocks	Lisp Routine
PWATER	5 (BLUE)	CONTINUOUS		WW - TO CHANGE
RAILROAD	3 (GREEN)	CONTINUOUS		
RANGE	7 (WHITE)	CONTINUOUS	LOT	
RIVERNAME	3 (GREEN)	CONTINUOUS		RV
ROAD	4 (CYAN)	CONTINUOUS		RD - TO CHANGE
ROADNAME	4 (CYAN)	CONTINUOUS		RN
RRTEXT	2 (YELLOW)	CONTINUOUS		RR
RW	2 (YELLOW)	RW		
RWTEXT	3 (GREEN)	CONTINUOUS		RW
SMALLDIMS	7 (WHITE)	CONTINUOUS		SD
STPARK	4 (CYAN)	STPARK		
SUBLOT	2 (YELLOW)	CONTINUOUS		SU,SU1,SUB,SUB1
TOWNLIN	6 (MAGENTA)	TOWNLIN		
TOWNNAME	6 (MAGENTA)	CONTINUOUS		TN
TRAIL	3 (GREEN)	DASHED		
UNDRD	3 (GREEN)	CONTINUOUS		
UTILITY	1 (RED)	UTILITY		
UTILTEXT	1 (RED)	CONTINUOUS		UT
WATER	5 (BLUE)	CONTINUOUS		WA - TO CHANGE
WETLAND	5 (BLUE)	WETLAND		WE - TO CHANGE
ZONE	5 (BLUE)	ZONE		
ZTEXT	5 (BLUE)	CONTINUOUS		

CAI wants to emphasize that all parcel compilation for this project shall be done completely by its own experienced and trained in-house staff. No part of this process will be subcontracted or performed in any manner outside of CAI's offices. No offshore facilities or individuals who are not properly authorized to work in the U.S. shall be employed on the project. The implications of this statement are worth consideration.

### 3. Scales

Map scales shall be: 1"=200' for the entire Town, and 1"=100' for selected areas in the Town. Please refer to Appendix C for CAI'S Proposed Map Scale Boundaries (Sample Index Map). The specific scale limit boundaries shall be determined after consultation with the Town.

As part of this proposal and further described later in this document, CAI proposes an additional optional service for developing a 100 scale planimetric base map. The planimetric base map will meet National Map Accuracy Standards (NMAS) for 1"= 100' scale mapping. CAI will endeavor to reconcile available parcel record information to said base. However, due to varying accuracies inherent within source and record data, CAI cannot guarantee that the parcel composite will meet NMAS, nor can any other vendor.

### 4. Dimensions and Acreage

Dimensions of property lines shall be shown on the maps. Dimensions shall be those obtained from the deeds or surveys. Where no such record dimensions exists, a scaled dimension may be shown followed by the letter "s" to indicate that the dimension is scaled. This shall be done for road and/or water frontage dimensions only. Where deed dimensions do not agree with the amount of distance available on the base manuscripts, the discrepancy shall be noted by placing the letter "d" following the deed dimension and then showing a scaled dimension. This shall be done at CAI's discretion only where there is a significant variation, and it is also dependent upon map scale.

Bearings and dimensions will not be stored as attributes for any GIS parcel line features. As part of CAI's standard project proposal, CAI will not be modeling and delivering the final GIS deliverable in an ESRI parcel fabric data model. Please see additional optional services for additional scope and fees related to the ESRI parcel fabric.

Acreages of all parcels shall be shown on the maps, except for those where the parcel's size makes it difficult to show, or where the acreages could tend to clutter the maps. All non-surveyed acreages shall be calculated using computer software. All survey acreages shall be indicated by the subscript Ac, while all calculated acreages shall be indicated by the subscript AcC. Calculated acreages shall be rounded as follows: less than 1 acre, to the nearest .01 acre; 1-15 acres to the nearest 0.1 acre; more than 15 acres to the nearest acre. If survey areas are shown on the source data as square feet, they shall be converted to acres, rounding to the nearest .001 acres.

#### 5. Information to be shown - Parcel Maps

- a. Boundaries of individual parcels, including record dimensions.
- b. Parcel (lot) numbers.
- c. All parcel dimensions of record
- d. Parcel areas, space permitting.
- e. Building Planimetric Features (if planimetric base map option is selected or if provided by the Town)
- f. The original lot lines of filed subdivisions should be shown by means of tick marks at line angles so that they will be readily visible but subdued from the rest of the data on the maps. Lot numbers from the subdivision plans shall be shown in a manner distinct from other numbers on the maps by enclosing the number in a circle and placing it in an area of the parcel away from its frontage.
- g. The location and names (or designations) of streets, highways, rights of way, private ways, rivers, lakes, waterways, and significant swamps.
- h. Major cross Town easements and Utility cross Town rights-of-way.
- i. Popular names of wholly tax exempt property.
- j. Adjacent map numbers, using the index diagram.
- k. X and Y coordinates from the New Hampshire State Plane Coordinate System (NAD 83 US Feet)
- l. Disclaimer "This map is for assessment and planning purposes only. It is not to be used for description, conveyance, or determination of legal title".

#### 6. Index Map - An overall map of the community shall be prepared, at a map scale sufficient to show entire Town on one 24"x36" (D-sized) sheet and one 36"x44" (E-sized) sheet. Said Index Map shall show:

- a. The layout of the map sheets.
- b. Corporate boundary lines of the entire municipality.
- c. Existing road network with Street and State Route Names, Right of Ways (ROWS), Rivers, Lakes, Waterways, and Swamps as identified and provided by the Town.
- d. A title block including the date the mapping was completed.
- e. A legend.
- f. X and Y coordinates from the New Hampshire State Plane Coordinate System (NAD 83 US Feet)

#### 7. Digital Compilation

All data shall be digitized using AutoCAD software in a professionally acceptable format, per the standards previously listed.

#### 8. GIS Processing

All parcel data shall be processed and stored in a seamless topologically correct composite, structured and processed into an ESRI formatted file geodatabase and delivered via a mass storage device or via an FTP site. The file geodatabase shall be suitable for use with the most current version of ArcGIS Desktop software.

The parcel composite shall be modeled in New Hampshire State Plane Coordinates (NAD 83 US Feet) with all associated Federal Geographic Data Committee (FGDC), compliant metadata delivered in HTML, XML and ascii format.

CAI shall deliver parcel data having GIS feature classes for continuous lines and closed polygons with no overlap, gaps or dangles. Line features of the parcels should reflect the most accurate dimensions of record based on the CAI’s documented research and orthophoto/basemap verification.

CAI shall organize the resulting geodatabase deliverable in a manner that supports parcel numbers, dimensions and acreages stored as annotation layers.

CAI shall organize the resulting geodatabase deliverable in a manner that supports additional map layers/annotations be modeled as separate feature class components.

The final file geodatabase deliverable shall match CAI standard parcel mapping project delivery and not be modeled using ESRI’s Parcel Fabric Data Model. As part of CAI’s standard project proposal, CAI will not be modeling and delivering the final GIS deliverable in an ESRI parcel fabric data model. Please see additional optional services for additional scope and fees.

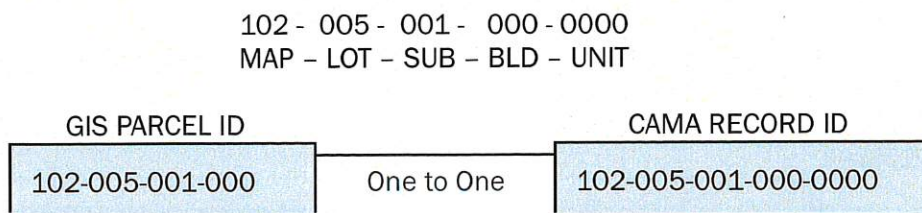
The parcel layer shall include a concatenated linking attribute field to support linking by Parcel ID with the Town’s CAMA data. CAI shall deliver mismatch reports identifying parcels that do not link in both directions. CAI shall work with the Town Assessor to reconciled said mismatches prior to the production of the final deliverable. CAI has successfully linked parcel data to CAMA export data originating from Vision Government Solutions assessment database solutions.

### PARCEL NUMBERING

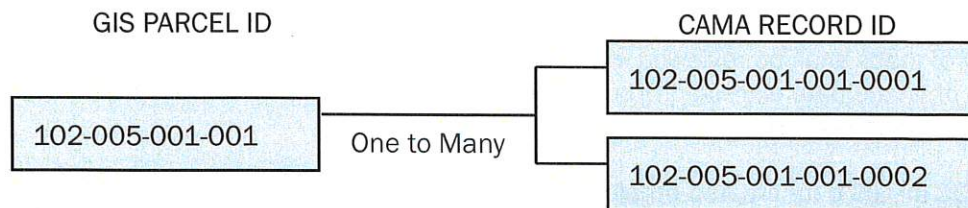
- 1. Every parcel of land shall be assigned a unique parcel identification number.

The proposed parcel number will consist of five parts: the map number (###), lot number (###), subplot number (###), building number (###), and condo number (#####). CAI shall work with the Town to be sure this numbering scheme is appropriate and make adjustments as necessary. Recognizing that the Town will be using the parcel data developed in the project to link “many to one” relationships between their CAMA data and the parcel polygon layer, we wish to stress the importance of the building and unit identifiers.

The use of a Building Identifier will facilitate the Town’s GIS to link to the building level. For instance, if in the GIS environment, the user selects a particular photo-identifiable multi-unit building, e.g. Condominium, that user will get the records only associated with that building. Our experience shows this model is critical for use in emergency response GIS application. Further, the use of the building identifier allows us to associate “non-land” records, e.g. mobile homes, to the related parcel.



102 - 005 - 001 - 001 - #####  
 MAP - LOT - SUB - BLD - UNIT



2. If parcels are sub-divided after the property map has been numbered, each piece of land carries the same base parcel number (map and lot) as before, but with a suffix (sublot).
  - a. Retained parcel maintains the whole number; the sold off portions are suffixed starting with the number "001" as sublot.
  - b. A maximum of three digits for the sublot will be allowed.
3. Parcels shall be numbered on each map sheet beginning with the number 1. Numbers shall flow consistently and systematically along roads and streets with the intent of complying with standard field appraisal practices to assure efficiency in navigating around each map sheet.

## INDEX/ATTRIBUTE DATABASE

1. Information to be shown in the map index system shall include, but not necessarily be limited to, the following:
  - a. Parcel Id number
  - b. Owner's name
  - c. Deed reference
  - d. Parcel area
  - e. Parcel location
  - f. Survey or subdivision name
  - g. Survey or subdivision lot number
  - h. Old tax map and lot reference, if applicable
  - i. Tax exempt status
2. All attribute data shall be input into unique fields and manipulated using MS Access, an SQL RDMS. This is a powerful, industry standard software which is completely GIS compatible.
3. The index shall be provided in computer printout format, as well as in txt/csv and/or Excel digital format. The hard copy indexes shall be provided in three different sorts; numerical by new Parcel Id number, alphabetical by owner's name, and numerical by old map and lot number to facilitate the transfer of the new map data to the Town's assessment records.
4. An Area Report shall be provided which shall include, at a minimum, new Parcel Id Number, surveyed acreage, calculated acreage, assessed acreage, and percent difference for each parcel.
5. This is a fundamentally important component of a successful parcel mapping program. It's more than a simple index; it gives integrity, reliability, and defensibility to the graphic database (maps). It corresponds perfectly, one-to-one, with the graphic database (parcel maps). If these features are important to the Town's land inventory system, then you cannot afford to be without this important link.

## QUALITY ASSURANCE PROCEDURES

Quality Assurance Procedures for the project shall be performed by Sandra Butson, Terri Parks and Rhonda Caron. Tim Fountain, GISP, shall be responsible for the overall management of all Quality Assurance procedures. The entire set of maps shall be reviewed, on a sheet by sheet basis, for aesthetics, as well as for completeness and accuracy of all the data extracted from the record research which is compiled onto the base map and then converted into the digital files.

CAI shall QA/QC all GIS data created employing the following mechanisms:

1. CAI shall verify that all digital data have been captured and incorporated into GIS format. CAI shall visually inspect the data content and compare all resulting content with original source data where necessary.
2. CAI shall create and inspect all functions and procedures used to automate the processing of the Town's GIS data to ensure content completeness and project integrity.
3. CAI shall verify all resulting topology on resulting geodatabases. CAI shall resolve all necessary node and label topology errors.
4. CAI shall ensure that all geodatabases have been correctly projected to the New Hampshire State Plane NAD83 Coordinate System.
5. CAI shall verify that all appropriate database attribution has been captured and integrated into all required geodatabases.
6. CAI shall incorporate metadata consistent with Federal Geographic Data Committee (FGDC) Content Standards for Digital Geospatial Metadata.
7. CAI shall ensure that all delivered data are provided in a logical directory standard, thus ensuring data are well organized, functional, and completely cataloged state.

## SCAN & LINK PLANS FOR USE IN AXISGIS

CAI shall electronically scan to PDF format all pages of survey and/or plan copies inventoried as part of the parcel mapping project.

CAI shall develop a database linking table to facilitate linking the related plan(s) to the related parcel(s) for easy access through CAI's AxisGIS Online GIS platform.

## PILOT PROJECT

Pilot project shall cover an area of up to four contiguous parcel map sheets. The pilot is intended to test all production methodologies and establish successful procedures to follow throughout the remainder of the project. The pilot area shall be plotted and presented to the Town for review.

During the pilot, CAI shall:

1. Work with the Town to finalize the database design for the Geodatabase that will contain the required parcel data sets.
2. Test the proposed method to manage many-to-one condominiums.
3. Develop a checkplot and final plot design. Based on draft plots, the Town will determine the contents of the final tax map plots.
4. Finalize the delivery schedule based on the results of the pilot.



Upon completion of the pilot draft, CAI shall deliver seamless digital GIS data and a set of black white check plots at map scale.

Upon successful completion of the pilot, the Town will authorize full production of all parcel data in one delivery.

## PUBLIC REVIEW

1. After a complete set of preliminary tax maps are delivered to the Town, there shall be an informal public review session to enable taxpayers to view the maps for accuracy. This shall be a two day period covering a maximum of twelve (12) hours, including a Friday, and a Saturday. It shall be the Town's responsibility to advertise said review session.
2. Landowners are encouraged to bring in any information they may possess in order to compare to the newly compiled maps.
3. Representatives of CAI shall be available to hear complaints and explain the mapping process to landowners. They shall include the project supervisor and a principal of the firm. Having held Public Review sessions for over 180 original mapping projects over last 34 years, CAI's staff is well versed in the process of explaining the mapping process to landowners and answering any questions that may arise.
4. CAI shall correct all errors of delineation brought to their attention at the public review, in both the graphic and attribute databases.
5. New prints of said corrected maps and printouts of said indexes, as well as corrected digital data, shall be furnished within thirty (30) days without additional charge.
6. CAI shall provide to the Town a listing of all property owners attending said public review.

## MUNICIPAL STAFF TRAINING

1. Training in the administrative use of the parcel maps and full utilization of the AxisGIS online services shall be provided for the Town and its staff.
2. Should the Town choose to have the map data maintained in-house, the Town will need to have staff well versed in AutoCAD and/or ArcGIS Desktop software. Training in these softwares shall not be provided by CAI as part of this project. However, the Town may wish to consider a separate contact with CAI for on-site or off- site technical support services. The scope of this service shall be determined based on the Town's future needs and in-house staff skills.
3. Should the Town choose to have the map data maintained by CAI, CAI is prepared to provide complete map maintenance services. Map maintenance should be done on a regular basis, not less than annually. Such maintenance would be subject to agreement between the Town and CAI upon completion of this contract. This section does not relieve CAI from its responsibilities to provide map maintenance education to the Town.
4. CAI is serious and sincerely committed to the proper and timely maintenance of our client's mapping capital investments. Over 400 municipalities throughout the Eastern United States have placed their confidence and trust in CAI's stewardship of all or part of their mapping and/or GIS systems.
5. Throughout the project, as a result of communication between the Town and CAI, various amounts of training and expertise will be given to the Town. Training and education is a continuous process in which CAI vigorously participates. We want you to be totally comfortable with using the mapping system.
6. Following delivery of the final map products, a debriefing on the project shall be held. Representatives of the Town and Tim Fountain, GISP, a principal of CAI, shall schedule the debriefing at a mutually

acceptable time and place. During the debriefing, training, CAI's map maintenance workflow discussion, and many other interesting and informative issues shall be discussed. Also, helpful forms shall be distributed to the Town.

- CAI actively supports its client's mapping and GIS systems. We have a department, headed by Franco Rossi, a principal, whose sole responsibility is map maintenance. We offer different levels of service, depending on municipal needs. Generally, we encourage municipalities to send data on a regular basis to us so maps and indexes can be kept current and accurate.

We have several different options available for system support and file updating transmission. Suffice it to say that we've been in the mapping business a long time and we're here to stay. We are constantly looking for newer and better ways to provide maintenance, refinement, and updating services.

## AXISGIS WEB MAPPING SOLUTION

### AxisGIS Product Overview:

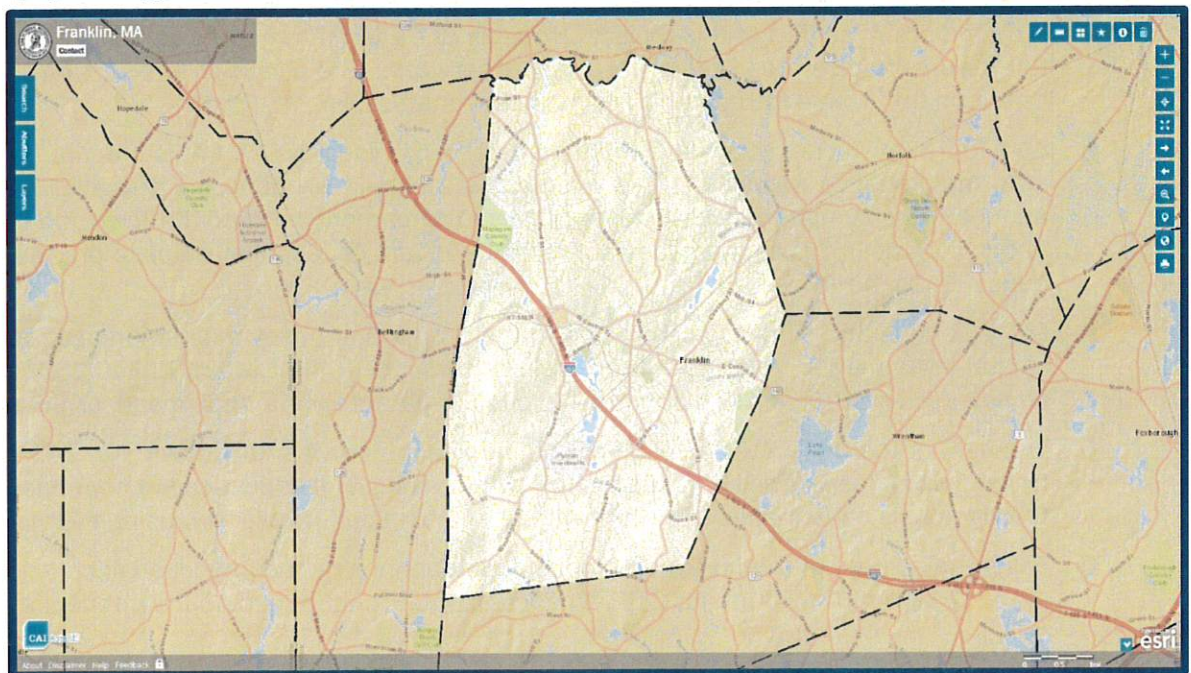
AxisGIS is an Internet-based service for communities and businesses that want to publish their GIS online. AxisGIS is a cost-effective option to distribute GIS data and utility to multiple staff in multiple physical locations as well as to the general public. AxisGIS is developed on JavaScript / HTML5 technology which results in a responsive user interface that is cross browser compatible and functional in a mobile environment.

AxisGIS clients pay no software fees, no annual software maintenance fees, and very low setup costs. AxisGIS even provides the web server. By relieving most of the expense, AxisGIS enables the people behind the data to focus on why their GIS is on the Internet in the first place.

AxisGIS is helping communities publish their parcel data online, enabling homeowners and real estate professionals to print maps from their own computers, supporting economic development projects, providing a platform for police and school collaboration, and creating a connection between local government, businesses, and communities.

### Functionality Overview:

The image displays the typical interface that Internet users would initially see in their web browser. This interface provides easy access to all available tools and functions.

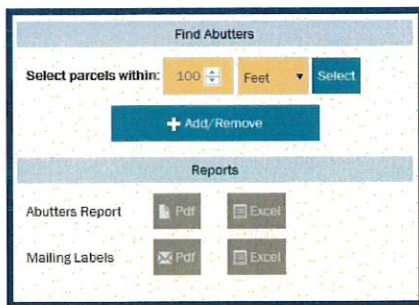


The TOWN's AxisGIS website will include the following tools:

	<b>Zoom-In Tool</b> allows the user to focus on a specific, smaller area on the map.
	<b>Zoom-Out Tool</b> allows the user to focus on a larger area on the map. Click the Zoom-Out tool and then click on the map near the center of the larger area you are interested in seeing.
	<b>Zoom to My Location</b> zooms the map to the current location of the user.
	<b>Zoom to Full Extents Tool</b> allows the user to quickly reset the map view to the original map extent.
	<b>Zoom Next Tool</b> allows the user to quickly zoom to next map extent when using previous map extent tool.
	<b>Zoom Previous Tool</b> allows the user to quickly zoom to the previous map extent.
	<b>Zoom Marquee Tool</b> allows the user to click and drag a rectangle surrounding the area you want to zoom in to.
	<b>Street View Tool</b> allows the user to click on the map to see Street View for that location.
	<b>Bird's Eye Tool</b> allows the user to click on the map to see Bird's Eye view for that location.
	<b>Print Map Tool</b> allows the user to generate a printable PDF map and allows the user the option to include a map legend.
	<b>Drawing Tools</b> allow the user to draw points, lines, shapes and text on the map. Once included on the map, the user can edit the graphics too.
	<b>Measure Tools</b> allow the user to click on the map to measure distance, area and coordinate locations.
	<b>Base Map Selector Tool</b> allows the user to browse and select from a variety of local, esri and google base maps to include in the map.
	<b>Areas of Interest Tool</b> allows the user to quickly zoom to a predefined area of the map.
	<b>Identify Tool</b> allows the user to click on a parcel and receive information about that parcel. This tool is useful in receiving ownership information.
	<b>Clear Selection Tool</b> allows the user to clear the selected map features(s).

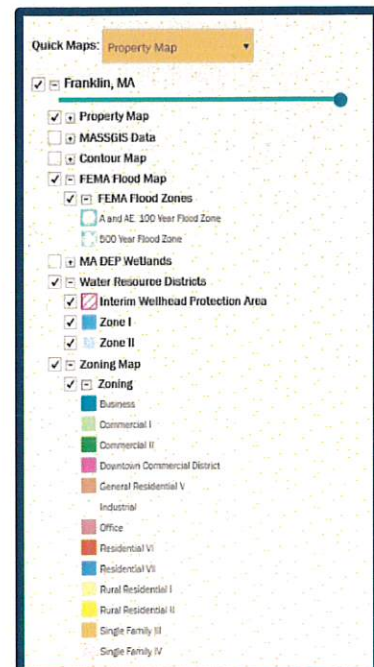
The **Search Function** enables the user to find properties by owner name, address or by parcel identifier, depending on the data available. As the user types the information in the Search dialog box the matching results begin to show in the list and corresponding points display on the map. The results list allows the users to view the property Building Image, Parcel #, Address and Owner. The user can then create a Results Report, Mailing Labels, Add/Remove records from the results, or select and zoom to a particular property.

Image	Parcel #	Address	Owner
	289-229-000-000	14-16 WALNUT AVE	FRANKLIN HOUSING AUTHORITY
	279-283-000-000	67 RUGGLES ST	FRANKLIN HOUSING AUTHORITY
	289-103-000-000	46 WINTER ST	FRANKLIN HOUSING AUTHORITY
	211-103-000-000	3 DERBY LN	FRANKLIN HOUSING AUTHORITY
	219-078-000-000	245 DANIELS ST	FRANKLIN HOUSING AUTHORITY
	297-181-000-000	1000 CENTRAL PARK TERR	FRANKLIN HOUSING AUTHORITY
	297-185-000-000	CENTRAL PARK TERR	FRANKLIN HOUSING AUTHORITY
	297-189-000-000	4-6 EAST PARK ST	FRANKLIN HOUSING AUTHORITY
	246-082-000-000	192 BROOK ST	FRANKLIN HOUSING AUTHORITY
	276-018-000-000	1 OLD FORGE HILL RD	FRANKLIN LIMITED PARTNERSHIP
	286-107-000-000	256-303 EAST CENTRAL ST	FRANKLIN SHOPPERS FAIR
	223-089-000-041	11-A WINTHROP VILLAGE	FRANKLIN LIMITED METHODIST CHUR



**Find Abutters Function** enables the user to select properties that are located within a specific distance to a particular property. To perform the Abutters search, the user selects the subject property then enters the search distance and clicks the select button. The map will show the selected properties and the user can generate an Abutter Report, Mailing Labels formatted to Avery 5160 labels and export the results to an Excel file by clicking the appropriate button.

The map **Layers** tab allows the user to turn on and off certain layers as needed. The user selects the checkbox next to individual layers to turn them on/off. The Layers tab also includes access to **“Quick Maps”**. This function provides quick and easy access to a set of predefined map layers that are already set up with display properties. The ability to utilize this function depends on the municipality’s available data. There is also a Transparency slider that allows the user to set the transparency for map layers to “see through” onto rich base map content.



There are several other notable features to AxisGIS. These include:

- **Map Printing Utility:** This utility allows the user to design and layout custom maps prior to generating a PDF to print, save or send via email. The user can enter a custom map title and define the printed map scale. The user has the ability to select the map template to generate the map size of 8 1/2" X 11" or 11" x 17" with either portrait or landscape orientation. This powerful utility also includes the option to include a map legend showing the symbology for the various map layers on the custom map.

- **Help System:** The help system is designed to provide assistance to users while accessing the AxisGIS website. The system includes an interactive PDF document that can be viewed in a web browser or downloaded and printed for future reference. The user also has the option to access the AxisGIS Product Feature Tour. The Feature Tour interactively guides the user through the various application functionality directly in the user interface.
- **Building Photos & Associated Documents:** This function allows users the ability to access building photos and/or documents related to particular properties and or features on the map. This functionality depends on the available data for the TOWN, how it is stored and the data format. CAI can work with the TOWN to determine if and how this functionality can be used within the AxisGIS application.
- **Staff Login Access:** This function allows for password-protected access to a specific set of geographic data layer(s) and/or attribute data within the community. The annual hosting fees associated with serving one (1) secure ArcGIS Server Map Service configured for access through encrypted username & password authentication are included with the base annual hosting fees for AxisGIS. Initial setup and configuration fees for this functionality may apply.
- **Google Street View:** AxisGIS includes access to Google Street View which allows a user to click on the map to access the Street View data for a particular area. This function is subject to Street View data being available within the community.
- **Microsoft Bird's Eye:** AxisGIS includes access to Microsoft Bird's Eye which allows a user to click on the map to access the Bird's Eye data for a particular area. This function is subject to Bird's Eye data being available within the community.
- **Zoom to My Location:** This function zooms the map to the current location of the user. This is particularly useful in the field and leverages the GPS technology in the user's mobile device.
- **Zoom to Coordinates:** This function allows the user to enter geographic coordinates zoom to that location and place a pin on the map.

### Publish the Town's GIS to the Internet

CAI shall publish the TOWN's GIS data to the Internet.

CAI shall notify the TOWN of the Internet Address (URL) for AxisGIS. This address can be added to the TOWN's web page.

After the TOWN has been notified that the AxisGIS application is on-line, the TOWN has thirty (30) days from the date of notification to examine the site and to request changes.

AxisGIS shall be accessible using the current versions of Microsoft's Internet Explorer & Edge, Chrome, Firefox or Safari web browsers over cable, DSL, or T1 (or greater) internet connections.

#### GIS Data Update:

CAI shall refresh the GIS data on the AxisGIS website annually. Should the TOWN be using CAI's annual parcel map maintenance services, this refresh of the GIS data shall be performed upon delivery of the annual map update data.

#### Attribute Data Update

CAI shall design and create a Data Processing Utility for the TOWN to use for periodic upload using an export file(s) from the CAMA system to an online database accessed by the AxisGIS website.

It is the TOWN's responsibility to maintain the Tabular attribute data, including a database table for any records to be excluded, for use by the AxisGIS website.

#### General Conditions

CAI shall provide the AxisGIS service to the TOWN with commercially reasonable access to an Internet-based mapping application service provider (ASP) environment through which the TOWN can access the TOWN data.

In order to provide the TOWN with commercially reasonable access to the ASP environment, CAI shall periodically schedule the complete or partial shutdown of the ASP Environment for maintenance, bug fixes, updates or other reasons. CAI will make commercially reasonable efforts to perform Scheduled Maintenance during off-peak hours.

#### TOWN Support

CAI shall provide telephone, fax, and email support services concerning AxisGIS to the TOWN. These services can be used to answer usage and technical questions.

CAI shall respond to any TOWN alerts concerning poor performance or lack of performance of the site, and provide verbal advisories as to how and when the site shall be corrected (if it is determined that the website and/or publication service is not performing properly).

#### DELIVERABLE PRODUCTS

All documents, reports, records, data or other material, in whatever form, physical or digital, obtained or produced during the performance of this project shall be the sole property of the Town and shall be delivered during an appropriate phase or at the conclusion of the project, as agreed to by the Town and CAI. The documents, reports, records, data and other materials shall include, without limitation, the specific deliverables listed below:

1. Errata list(s) and Area Report
2. Two (2) paper copies of each Tax map and Index maps, full size
3. PDF format of all tax maps listed above
4. Seamless ESRI file geodatabase of the developed tax parcel map data with accompanying metadata. The final file geodatabase deliverable shall match CAI standard parcel mapping project delivery, including line and polygon feature classes, and not be modeled using ESRI's Parcel Fabric Data Model. As part of CAI's standard project, CAI will not be modeling and delivering the final GIS deliverable in an ESRI parcel fabric data model. Please see optional services for additional scope and fees.

5. The metadata shall be consistent with the Federal Geographic Data Committee's (FGDC) Content Standard for Digital Geospatial Metadata.
6. Three (3) indexes, one (1) sorted alphabetically by owner names, one (1) sorted numerically by new map/lot number, and one (1) sorted numerically by old map/lot number
7. Public Review sessions documentation, report and action list.
8. Parcel composite and tax map management procedures and recommendations.
9. One year AxisGIS Online GIS hosting services.

## SCHEDULE / PROJECT TIMETABLE

	DATES		STAFF ASSIGNMENTS
	FROM	TO	
Project Commencement	April 2019		
OPTION: Custom Photography and 100 Scale Planimetric Base Map	CAI must have project award by April 17, 2019 in order to support the Spring 2019 flight and related additional options.		SUBCONTRACTOR
OPTION: Color Digital Orthoimagery at a 0.5' pixel.	August 2019		SUBCONTRACTOR
OPTION: Planimetric Base Mapping at 1" = 100'	November 2019		SUBCONTRACTOR
Parcel Inventory and Research	July 2019–June 2020		TIM FOUNTAIN, SANDRA BUTSON DON BUTSON
Errata List(s) and Area Report	December 2021		SANDRA BUTSON, SANDRA ROSSI
Digital Compilation	December 2019–June 2021		TIM FOUNTAIN, DON BUTSON, SANDRA BUTSON
Pilot Area	June 2020–December 2020		TIM FOUNTAIN, DON BUTSON, SANDRA BUTSON, RHONDA CARON, SANDRA ROSSI
GIS Layers – QA/QC	July 2021–October 2021		SEAN FAIRHURST, RHONDA CARON, LUKE UHLMAN
Printed Map – check plots	August 2021–September 2021		TERRI PARKS, SANDRA BUTSON
Indexing	June 2019–October 2021		SANDRA BUTSON, DON BUTSON, SANDRA ROSSI
Renumbering	June 2021–August 2021		SANDRA BUTSON, DON BUTSON SANDRA ROSSI
Public Review	October 2021–November 2021		TIM FOUNTAIN, SANDRA BUTSON, DON BUTSON
Project Debriefing	December 2021		TIM FOUNTAIN
Final Work Products Delivered*	December 31, 2021		TERRI PARKS, TIM FOUNTAIN, SANDRA ROSSI

\* If compilation and delivery in the Parcel Data in ESRI Parcel Fabric Data Model option is selected, project delivery will be adjusted to December 31, 2022.

## TOWN RESPONSIBILITIES

The Town shall designate a project liaison who will be CAI's main contact during the course of the project, and who will be responsible for all Town related obligations in this project.

The Town shall provide and authorize CAI to acquire all necessary data for the successful completion of the project. In order to ensure the project timetable, authorization shall be provided within fifteen (15) days of CAI's request.

The Town shall receive periodic reports from CAI and shall receive and evaluate the progress of the project and notify CAI as to whether the work to date is timely and satisfactory.

The Town shall provide "parcel identification data" in an acceptable format for each parcel, from its Assessor's database, including, at a minimum, the following items: Owner's name(s) and mailing address, property location, property acreage and sub-division (if available) and deed references.

The Town shall provide all recorded property conveyance deeds and surveys, in either hard copy or digital, throughout the project timeframe.

The Town shall provide CAI with any and all existing maps and plans, and copies of all deeds and abstracts in their files. CAI shall hold these files for the duration of the project.

All materials shall be returned to the Town's files as soon as possible after completion of the project. CAI assumes full responsibility of all materials in its possession, and all materials shall be returned in the same condition as when taken.

## DATA OWNERSHIP

1. The Town shall own all digital data generated as a result of the project described in this proposal. CAI shall deliver all digital data, created as part of the project, to the Town. Additionally, it is important to consider several issues:
  - a. Electronic data can be easily modified, manipulated, and used for purposes other than those originally intended by nearly anyone who has access to computers.
  - b. The data being created for this project have limitations which restrict their appropriateness for applications outside the scope of this project.
  - c. CAI guarantees its work and, as part of any contract resulting from this proposal, may be making subsequent changes to the database.
  - d. CAI may serve as a data repository for the Town.
  - e. The actual format of the databases created by this project constitute CAI's intellectual property and said format shall be used by CAI on other projects.
2. For these reasons, it is vitally important that CAI and the Town protect themselves against any misuse of the data. CAI strongly recommends that the Town, in order to limit its liability, draft a data licensing agreement or appropriate disclaimer form, should the Town release copies of the data or any portion thereof to a third party; subject to any federal and state regulations concerning public information and 'right to know'.



## GUARANTEE

CAI guarantees its work. Although we make a sincere, genuine attempt to completely understand and comply with all aspects of the project, in the event that we do err or omit something, it will be corrected promptly at no additional cost to the Town.

This guarantee applies to the work performed and services provided herein. It does not apply to errors or omissions in source documents used by CAI in the course of the project, and over which it has no control. Also, it does not apply when new information, not available during the contract period, is provided to CAI.

To obtain guarantee services, the Town shall submit map correction forms to CAI which describe the problem to be resolved. CAI shall respond to all such submissions within 30 days, usually sooner.

## ADDITIONAL OPTIONAL SERVICES

### COMPILE AND DELIVER PARCEL DATA IN ESRI PARCEL FABRIC

CAI will work with the Town to define the appropriate initial database setup, elements and database schema to deliver the parcel geodatabase modeled in an ESRI Parcel Fabric using the Local Government Information Model.

A parcel fabric typically includes of the following elements:

- Parcel lines, which have different categories and store COGO dimensions
- Parcel points, which store x,y,z coordinates that can be adjusted in a fabric adjustment
- Parcel polygons, which store area, parcel identification information, and are defined by parcel lines
- Line points, which constrain parcel points to lie on the boundaries of adjacent parcels
- Control points, which are used in a fabric adjustment and have accurate coordinates for a physical location
- Plans (table), which store information about the record of survey
- Parcel fabric jobs (table), which track edits to the parcel fabric
- Accuracies (table), which store weights that are used on parcels and lines a fabric adjustment
- Adjustment vectors (table), which store sets of displacement vectors from fabric adjustments

During the project CAI will capture the available bearings, distances and data source references and populate the geodatabase feature classes with this data.

During the parcel compilation phase, CAI shall review and, where appropriate, implement the parcel fabric COGO standards for line, point and polygon features.

Where available in source record information, CAI shall assign control points to parcel points for fabric adjustment.

CAI shall review and clean the parcel fabric to meet model standards.

CAI shall implement parcel fabric adjustment best practices where appropriate.

### DATABASE INTEGRATION SCRIPT

CAI will work with the Town to implement the best possible use of available technologies to achieve a "link" from the new parcel data to the Town's CAMA system.

This may include, but is not limited to, database replication, scripting and/or Spatial View creation.

CAI will analyze the existing infrastructure, workflows and security context, make a recommendation and assist in the final implementation.

CAI will provide documentation and training on all aspects of the implementation.

This service is proposed as an "off-site" service and will require remote access from CAI staff into the Town's network. Should the Town require an "on-site" presence from CAI to complete this service, an additional cost shall be applied.

## HOURLY TRAINING

CAI can provide general GIS consulting and technical support services to the TOWN. Said services can be performed off-site using telephone, email and remote desktop communication or on-site if necessary. These services shall also include, but not necessarily be limited to, general GIS system consulting, parcel data editing, ArcGIS technology guidance & implementation, and overall GIS guidance services as directed by the Town.

These services shall be provided to the TOWN in a manner consistent with professional GIS best practices and standards.

## SPRING 2019 CUSTOM PHOTOGRAPHY AND 100 SCALE PLANIMETRIC BASE MAP

### AERIAL PHOTOGRAPHY

1. Aerial Photography will be obtained for the Town at the optimum time of day to reduce length of shadows. Prime conditions for flight would be when the trees are free of leaves, the ground free of snow, water bodies free of ice and when there are no unusual high water conditions.
2. Prior to obtaining the photography, aerial targets will be placed at strategic locations. These targets will be utilized as part of the Ground Control Survey. The photography will be at a scale of 1"=1100'± suitable for base mapping purposes to 1"=100'.
3. The photography will be obtained utilizing an aircraft equipped with a precision mapping camera. The camera has a 6" focal length with a 9" x 9" negative exposure. The camera is mounted in such a manner that it has an unobscured view, free from exhaust gases, air turbulence, and oil effluence.
4. The aircraft is maintained and operated in accordance with the regulations of the Federal Aviation Administration. The flight crew is fully qualified to operate the aircraft within FAA regulations. The pilot is a commercially rated pilot meeting any insurance requirements.
5. The imagery will be exposed with color film. Once the photography has been obtained, the color film will be processed and developed. After the developing process is completed, the film will be inspected and edited for printing. One set of 9" x 9" contact prints is laid out in a manner to check for overlap, side lap, and coverage. That set of prints is also utilized as the control photographs. These photos will be marked up with requirements for the Ground Control Survey. Additional sets of prints will be produced and used for photo indexes, cropping for enlargements, and delivered to the Town for their use.
6. The Aerial Photography will meet the following specifications:
  - A. Area of Coverage - The legal limits of the Town shall determine the area to be covered with vertical photography and shall also include sufficient overlap beyond the exterior perimeter of the legal limits of the Town.
  - B. Flights - Shall be accomplished in a manner to insure full stereoscopic photographic coverage providing the following:
    - Endlap (overlap of aerial negative coverage in line of flight) - Shall average 60%, plus or minus 5%.
    - Sidelap (overlap of parallel strips of vertical photography) - Shall average 25%, plus or minus 10%.
    - Altitude - Shall not vary more than 5%.
  - C. Crab - In excess of five (5) degrees may be cause for rejection of the flight line of negative or portion thereof in which such excess crab exists.
  - D. Tilt - Shall not exceed four (4) degrees for any exposure and shall not average more than two (2) degrees for any ten (10) consecutive exposures.

- E. Foliage - Minimum for all flights.
- F. Snow - Shall not be present and all streams and lakes shall be within their normal banks.
- G. Solar Altitude - Shall not be less than thirty (30) degrees when negatives are exposed.

7. The Camera, Film, and Negatives will meet the following specifications:

- A. Aerial Cameras - Shall have a minimum amount of radial lens distortion, produce at least four (4) fiducial (reference) marks on each negative, and have a recent certificate of calibration.
- B. Aerial Film - Shall be a fine grain, high speed, photographic emulsion on dimensionally stable safety base.
- C. Negatives - Shall be free from static marks, blemishes and other stains. Negatives shall also display the proper degree of contrast for all details.
- D. Ownership - Ownership of negatives shall remain with the Town, although they may be stored with CAI to insure stability. Permission from the Town is necessary to reproduce negatives.

## GPS GROUND CONTROL SURVEY

### 1. Purpose

A Ground Control Network must be established before any mapping can be prepared. Control points are selected at strategic locations throughout the Town. These points are surveyed as X, Y, and Z points. The X & Y are based upon the New Hampshire State Plane Coordinate System, (NAD83). The Z point being an elevation based upon the National Geodetic Vertical Datum (1988). The horizontal network and any monumentation is observed using Ashtect Dimension GPS receivers. All field data is collected within the GPS receivers at the time of the actual field observations. The results of each GPS observation section can be found in a report that lists the GPS baseline vectors that are derived from the data collected during a particular session. The GPS vectors forming the control network are adjusted using "FILLNET", a least square adjustment program, provided by Ashtect in the PRISM GPS software computer program. The results of this adjustment are contained within the Control Report.

### 2. Control Report

The Control Report will have a section that contains diagrams of each individual control point that is either recovered or established during the process of performing the control survey. Each diagram will contain the following information that is relevant to that particular control point; Latitude, Longitude, Northing and Easting State Plane Coordinates, Elevation, and method by which the elevation is derived. An overall control diagram will be included that shows the location of the GPS control network noting whether the station is either recovered or established. The approximate locations of benchmarks that are used as a basis for elevation will be noted on the control diagram.

### 3. Horizontal Control

Sufficient horizontal control points will be established and marked throughout the Town to meet National Map Accuracy Standards. A minimum of 16 points will be located. The location of each marked control point shall be symbolized on the face of the appropriate photograph by a triangle and annotated on the back.

### 4. Vertical Control

Sufficient vertical control to set-up the stereo-models in the analytical stereoplottter will be established. Vertical Control is established on the control network by using several existing benchmarks that have been established by the National Geodetic Survey.

## AERIAL TRIANGULATION

### 1. Photography Layout

- A. Control points - All targeted and photo identifiable points shall be located, symbolized and labeled on the photographs.

- B. Passpoints - Using a stereoscope, passpoints are selected manually and labeled. All efforts will be made to insure a good selective location in clear unobscured level ground. These points serve as bridging points for each model within a flight line. Individual frames will carry a minimum of three points, and stereo models will carry a minimum of six.
- C. Tie points - As general rule, edge or wing points will serve as tie points to adjoining flights. Each stereo model will have a minimum of one tie point.

## 2. Scans

The scans will be free from scratches, abrasions, fog, and streaks.

## 3. Faat Software

Albany software, which is a full bundle adjustment, is used.

## 4. Pug Transfer

All point marking or pugging will be accomplished using a Wild Pug III point transfer device.

## 5. Aerial Triangulation Report

After completion of measurements using a Wild BC-1 and BC-2 analytical stereoplotter, the aerial triangulation solution will be produced using Albany software. The computations will include ground control data and triangulated ground points.

## DIGITAL PLANIMETRIC BASE MAP

Planimetric Base mapping will be compiled utilizing the aerial photography viewed stereoscopically on scanned images. Modern photogrammetric and computer graphics technology make it possible to collect, store, and use map data in a digital form.

Planimetric Base map data will be collected with the use of a Kern DSR14 ANALYTICAL stereo-plotter. The DSR14 instrument is augmented with Kern PC PRO600 software to perform relative and absolute orientation with the controlled photography. Once absolute orientation is achieved the compilation information is captured utilizing DAT/EM digital mapping software. DAT/EM works directly in AutoCAD; therefore, there is no translation of data.

Compilation of map data is digitally recorded in the form of coordinate values as it is stereoscopically compiled. The digital map is coded by line/symbol/feature type and organized into layers representing specific categories.

Specific planimetric feature layers may include roads and trails, buildings, water features, title block/format data, etc. Map detail will be at the scale of 1"=100'.

Editing of digital map data is performed on-line (during data collection) and off-line (following data collection) using stand-alone graphics editing stations. The off-line stand-alone graphics editing stations include computers with Altek and Kurta digitizing tables. The digital systems consist of the latest AutoCAD version with DCA COGO and DAT/EM Map Editor software. The on-line graphics system utilizes Pentium computers with AutoCAD and DAT/EM software.

A seamless planimetric base map will be created during collection of data, delivered in a .dwg format.

## Base Map Detail 1"=100' Mapping

The following planimetric features (where visible and applicable) are captured and plotted a scale of 1"=100':

Airports -outline runways, aprons_and taxiways-separately	Athletic Fields -Outline playing field and label
Paved Roads -edge of pavement	Athletic Field Fixtures -dugouts, bleachers, fences, etc ..
Gravel Roads -traveled way	Golf Courses -outline tees, fairways, greens and sand traps
Road Centerline	Playgrounds - public
Trails -single and double line	Cemeteries -outline and label
Railroads -both rails	Pits -any barrow pit, outline and label
Paved Driveways	Fences
Gravel Driveways	Retaining Walls
Paved Parking -any parking for 5 or more	Stone Walls
Gravel Parking -any parking for 5 or more	Guard Rails
Sidewalks -public only	Culverts
Bridges -edge of bridge deck	Rock Outcrops
Water -all water bodies and running water	Tree Lines -crown edge
Marshes	Single Trees -street and landmark
Ditches -manmade drainage	Hedges -hedgerows that appear to show boundaries
Dams -outline extents and sluiceways	Orchards -outline and label
Buildings -extents of roof line	Utility Poles
Tanks -fuel, water, and storage	Utility Boxes
Foundations -outline and label	Light Poles
Ruins -outline and label	Traffic Lights
Decks -8x8 or larger	Signs
Patios -8x8 or larger	Billboards
Stairs -prominent	Flagpoles
Docks	Monuments .Towers
Piers	Posts
Wharfs	
Swimming Pools -above and in ground	
Substations -labeled	

The mapping at this scale will not include relatively smaller features such as catch basins, hydrants, manholes, sidewalks, lone trees and bushes, roadside poles, street signposts, route markers, and so on.

### WARRANT OF ACCURACY

Ninety percent of all planimetric features shown on the map will be within 1/40" of their true position and no planimetric feature will be out of true position more than 1/20" at map scale, when referred to the nearest field established station. In areas of dense foliage or coniferous growth, the accuracies indicated above may not be met and no warranty is expressed or implied concerning such area. The mapping will meet National Accuracy Standards for 1" 100' scale mapping.

### MAPPING

Maps will be prepared utilizing standard stereo-photogrammetric compilation methods. Area to be mapped will be at a scale of 1"=100'. Features to be shown will include all those visible on photography which are generally shown on maps meeting national standards.

## COLOR DIGITAL ORTHOIMAGERY

The Digital Orthophotography shall be created from the new Spring 2019 color photography to a scale of 1" = 100'.

The resolution of 0.5 feet will accommodate image quality.

All images shall be feathered together to insure a seamless sheet. The orthophotography will be rectified and georeferenced to the New Hampshire State Plane Coordinate system and will match the planimetric mapping. The images will be delivered in a TIF format and may be compressed. All images will have checkpoints. These points, in addition to the planimetric mapping will be overlaid to check for position accuracies.

## COST PROPOSAL AND PAYMENT TERMS

Parcel Research	\$ 36,000	
Parcel Compilation	\$ 51,690	
Indexing and Reports (CAMA verification)	\$ 9,700	
Pilot Area	\$ 4,500	
Tax Map & Parcel Renumbering	\$ 9,600	
Annual Tax Map Updates	\$ 0	Included in mapping project, data shall be current to April 1, 2021. Future annual parcel update cost estimate to be \$3,900
Annual Parcel Fabric Updates	\$ 0	if Parcel Fabric Development option is selected in mapping project, data shall be current to April 1, 2022. Future annual Parcel Fabric update cost estimate to be \$11,700
Printed Maps	\$ 400	
Public Review and Reporting	\$ 6,000	
Staff Training / Project Debriefing	\$ 0	Includes training in use of the parcel maps and AxisGIS platform
Presentations to Town Council	\$ 0	<i>Includes up to 1 presentation Additional presentations \$900/ea</i>
AxisGIS Web Mapping Solution	\$ 0	
Annual Hosting Fees	\$ 0	Includes one year of hosting
<b>Sub-Total</b>	<b>\$117,890</b>	

### ADDITIONAL OPTIONAL SERVICES

Parcel Fabric Development: (This option will extend project delivery to 12/31/22)	\$115,950	
Database Implementation Script	\$ 1,500.00	Add \$1,500 if on site is required.
Hourly Training (additional)	\$ 1,500/day on-site or \$150/hr. off site.	
Spring 2019 Custom Photography and 100 Scale Planimetric Base Map (inc Ground Control)	\$ 46,020	
Color Digital Orthoimagery (0.5' Pixel)	\$ 5,900	



Payment shall be made to CAI within 30 days of invoicing. Said invoicing to be done as follows:

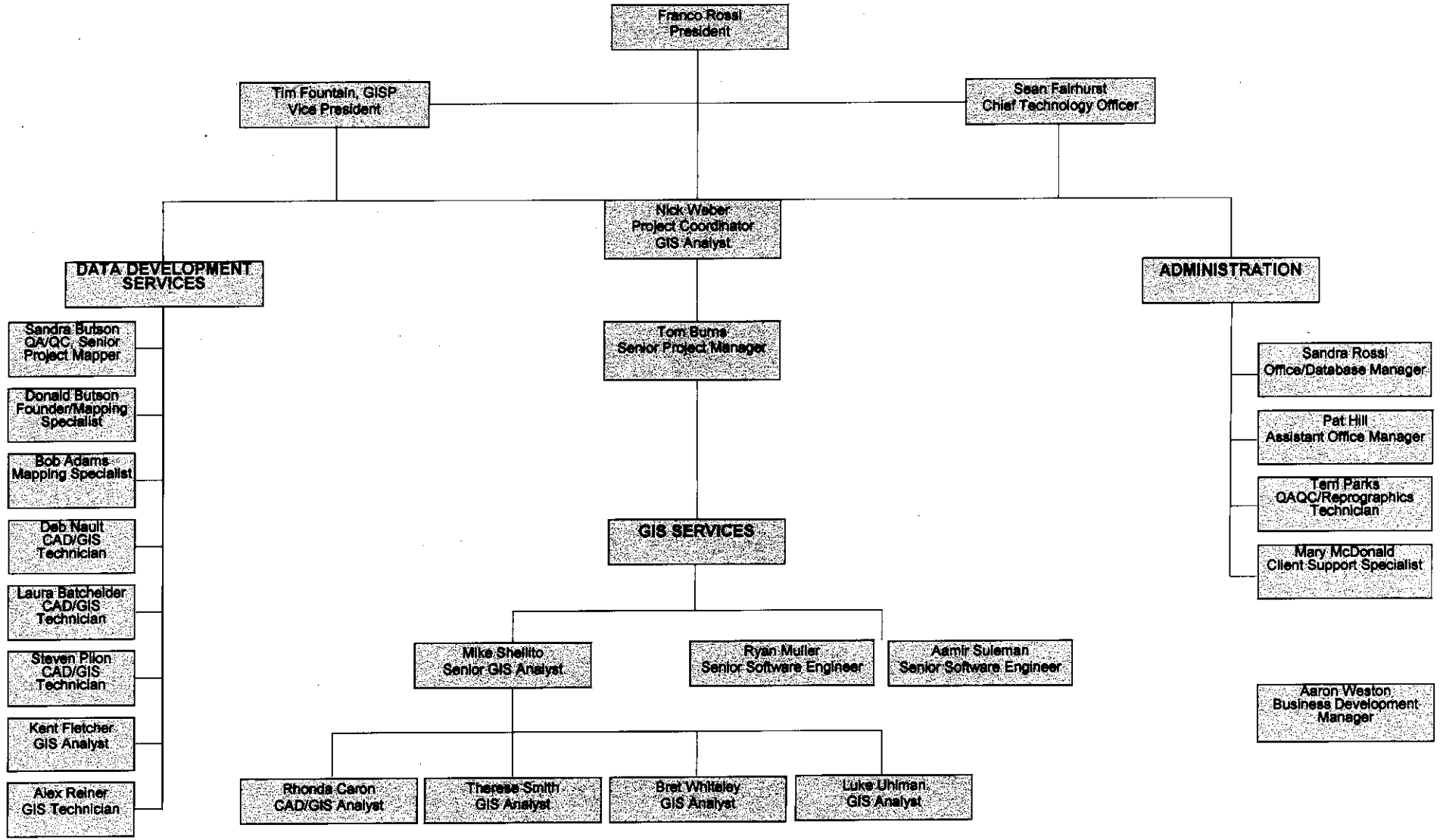
1. A payment of ten percent (10%) of the total project cost shall be made upon invoicing, after execution of the contract.
2. Payments shall be made to CAI monthly based on the portion of the work completed and reported to the Town during the preceding month, and based on progress reports submitted before payment is made.
3. The final ten percent (10%) of the total project cost shall be withheld and paid to CAI within thirty (30) days following the satisfactory delivery of all products.



# APPENDIX A – CAI ORGANIZATIONAL CHART AND STAFF RESUMES



# CAI ORGANIZATIONAL CHART





# FRANCO ROSSI

## PRESIDENT

CAI Technologies

## EDUCATION

Syracuse University - 1983-1984

Student in the School of Arts and Sciences. Accepted into the School for Architecture for the 1984-1985 school year. Chairman of Central Village Committee which worked with children in low income housing near the University.

Syracuse, New York

Vermont Technical College - 1981-1983

Received Associates degree in School of Architecture and Building. Member of the student chapter of American Institute of Architects.

Randolph, Vermont

## RELEVANT EMPLOYMENT

02/2011 -	Cartographic Associates, Inc. dba CAI Technologies Littleton, New Hampshire President <a href="mailto:frossi@cai-tech.com">frossi@cai-tech.com</a>
11/1999 - 02/2011	Cartographic Associates, Inc. Littleton, New Hampshire Executive Vice President Personnel Director
12/1993 - 11/1999	Cartographic Associates, Inc. Littleton, New Hampshire Vice President - Map Maintenance Personnel Director
07/1989 - 12/1993	Cartographic Associates, Inc. Littleton, New Hampshire Vice President - Map Maintenance
04/1985 - 12/1988	Cartographic Associates, Inc. Littleton, New Hampshire Project Mapper
01/1985 - 04/1985	C.T. Male Associates, Inc. Littleton, New Hampshire Project Mapper
10/1984 - 12/1984	Gordon E. Ainsworth & Associates, Inc. Littleton, New Hampshire Project Mapper
07/1984 - 10/1984	Lajeunesse Construction Inc. Barre, Vermont Drafting and Cost Estimating
05/1984 - 07/1984	Dwight Baker Engineer Montpelier, Vermont Survey and Drafting Work

## CONTINUING EDUCATION

- April 1987 NH Land Surveyors Association Seminar on Roads, Railroads and Rights of Way, Concord, NH
- Nov. 1987 School of Lifelong Learning Production Control, Concord, NH
- Oct. 1990 National Career Workshops How To Get Things Done Manchester, NH
- Sept 1991 Tom Peters' Excellence Seminar Burlington, VT
- Nov. 1999 Lesson in Leadership Bedford, NH
- Nov. 2001 NH Land Surveyors Association - Water Boundaries Conference
- June 2002 North Country GIS User Group

## PROFESSIONAL PROFILE

As President, Mr. Rossi has overall responsibility for all aspects of the Company. Over nearly three decades he has been directly involved in many of the production aspects of tax maps including deed research, parcel compilation, numbering and acreage calculations as well as direct communication with property owners to establish property lines. He has worked on more than 200 mapping projects in all six New England states, gaining valuable experience in different types of property map data.

Along with his duties as President, Mr. Rossi continues to be responsible for all aspects of the map/GIS maintenance services provided to more that 300 municipalities throughout New England.

Further, he is actively involved with marketing responsibilities and has participated in various conferences and seminars including multiple speaking engagements for the Rhode Island Assessors Association, Massachusetts Association of Assessing Officers, Vermont League of Cities and Towns, as well as in-house seminars for the New Hampshire Department of Revenue, Property Appraisal Division. He regularly attends municipal conferences in all New England States as well as Northeast Regional Arc Users Conference.

In December 1993, Mr. Rossi's dedicated efforts to providing high quality, responsive professional services to the firm's clients were rewarded as he became a stockholder and an owner of the company. In addition, he was elected to the firm's Board of Directors. In 2011 Mr. Rossi became the majority shareholder and is currently the President. As its sole Director, he is ultimately responsible for the Company's direction and is actively involved with maintaining the Company's leadership role in the mapping and GIS field as well as establishing mutually beneficial corporate relationships to the benefit of all Cartographic Associates, Inc. clients.



# TIMOTHY FOUNTAIN, GISP

VICE PRESIDENT  
CAI Technologies

## EDUCATION

GISP Certification - 2010

Plymouth State College - B.S. Geography - 1991  
Plymouth, New Hampshire

## RELEVANT EMPLOYMENT

05/2009 - Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
Vice President  
[tfountain@cai-tech.com](mailto:tfountain@cai-tech.com)

11/2003 - 05/2009 Cartographic Associates, Inc.  
Littleton, New Hampshire  
Manager, Parcel Mapping & GIS Services

12/2002 - 11/2003 CityNet Telecommunications, Inc.  
Silver Spring, Maryland  
Director, Project Management & GIS Services

08/2002 - 03/2003 MapInfo Corporation  
Lexington, Massachusetts  
Software Instructor

09/2000 - 08/2002 CityNet Telecommunications, Inc.  
Concord, New Hampshire  
Manager, Network GIS

1997 - 09/2000 Bureau of Emergency Communications  
State of New Hampshire  
Concord, New Hampshire  
GIS Supervisor

06/1995 - 1997 Cartographic Associates, Inc.  
Littleton, New Hampshire  
Project Mapper

## PROFESSIONAL CONTRIBUTIONS

2009 Presentation - The Beacon Society of Boston - GIS Online Mapping.

2008 Presentation - The Beacon Society of Boston - Access to New England GIS Resources.

2008 Workshop - CT. Conference of Municipalities - Using GIS to support Public Works Systems.

2007 Presentation - The Beacon Society of Boston - Using GIS in Our Everyday Life.

2006 Presentation - The Beacon Society of Boston - Introduction to GIS

2002 Paper - URISA 2002 Public Works Conference

2002 Presentation - 2001 CADTEL User's Conference

2002 Presentation - URISA 2002 Public Works Conference

1997 - 2000 N.H. GIS Advisory Committee - Committee Member

## CONTINUING EDUCATION

2002	CADTEL Systems Annual User's Conference – Phoenix, AZ
2002	URISA 2001 IT/GIS in Public Works Conference – Pittsburgh, PA
2001	ESRI International User Conference – San Diego, CA
2001	Introduction to Programming – ArcObjects with VBA
2001	URISA Spatial Data Privacy Workshop
2000	Advanced ArcView Training
2000	CADTEL Systems Training - Database Basics
2000	CADTEL Systems Training – SpatialBASE Administration
2000	Introduction to ArcView Training
2000	MapInfo MapWorld Conference – San Antonio, TX
2000	UNH – Geospatial Technologies – Visioning Session
1999	MapInfo MapWorld Conference – Bal Harbour, FL
1999	MapInfo Professional Training
1998	Trimble GPS Training
1989	Thematic Cartography

## PROFESSIONAL PROFILE

Mr. Fountain has extensive experience in management of large multi-faceted projects. This experience, combined with his excellent communication skills and keen attention to details, make him an extremely valuable asset to our management team and to our clients.

Mr. Fountain is responsible for providing overall management and corporate direction of the firm's professional GIS Services. He provides GIS application development support and data development delivery standards for parcel data maintenance of our municipal client base. He assigns project schedules for staff developers and CAI's CAD/GIS Analysts. He conducts GIS workshops, client staff interviews and needs assessments for municipal clients. In doing so, he defines and implements GIS system requirements and geodatabase design specifications to support strategic GIS implementation plans. He is also responsible for managing on-going development and maintenance of firm's ESRI ArcGIS Server and Desktop extension applications for use by Municipal and Public Works users communities. He works closely with clients' municipal system vendors/consultants to design and integrate GIS application and data development services to support sustainable enterprise GIS.

In 2010 Mr. Fountain was certified as a GIS Professional (GISP) by the GIS Certification Institute (GISCI). The GISP is a certified GIS Professional who has met the minimum standards for educational achievement, professional experience, and ethical conduct as established by the GISCI. The GISCI has strict requirements for continuation of education, experience, community and professional involvement, and on-going training. In addition, a GISP has had their professional background scrutinized and reviewed by an independent third party organization, an institute comprised of leading non-profit associations (AAG, NSGIC, UCGIS, and URISA) focused on the application of GIS and geospatial technology.

Mr. Fountain's professional experiences also include designing and implementing GIS in the telecommunications industry. He was responsible for designing and implementing enterprise GIS to support corporate business objective to market, plan, design, and construct fiber optic networks in sewer systems. This assignment included the design of an ESRI SDE database to interact with CADTEL SpatialBASE data model to support network engineering and operations activities for modeling the fiber networks. He identified the requirements and coordinated the

design of an ESRI ArcIMS Facility Viewer application used to explore information and documents related to network infrastructure.

Mr. Fountain professional experience also includes implementing GIS to support Emergency Services. During his assignment as GIS Manager for the State of New Hampshire E-911 Mapping Department he provided oversight and direct supervision to 20+ staff member department to include both field GPS Data collection and office GIS data development personnel. He was responsible for Managing and maintaining office and field GIS data management standards. He served as primary liaison with Bell Atlantic Address Management Center to ensure accurate address conversion and integration of GIS centerline data with call center database. He collaborated with other State agencies participating in data acquisition and distribution efforts and served on NH GIS Advisory Committee to develop and maintain statewide centerline mapping and addressing standards.



# SEAN FAIRHURST

CHIEF TECHNOLOGY OFFICER  
CAI Technologies

## EDUCATION

M.S. Managing Innovation and Information Technology;  
Champlain College, Vermont, 2005

B.S. Natural Resources;  
University of Vermont, Vermont, 1993

## RELEVANT EMPLOYMENT

- |                |                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 02/2011 -      | Cartographic Associates, Inc. dba CAI Technologies<br>Littleton, New Hampshire<br>Chief Technology Officer<br><a href="mailto:sfairhurst@cai-tech.com">sfairhurst@cai-tech.com</a> |
| 2002 - 02/2011 | Fairhurst Professional Services, LLC<br>Shelburne, Vermont<br>President                                                                                                            |
| 1998 - 2002    | Marin Environmental<br>Richmond, Vermont<br>GIS Manager                                                                                                                            |
| 1993 - 1998    | Information and Visualization Services<br>Burlington, Vermont<br>GIS Database Administrator                                                                                        |

## RELATED EXPERIENCE

- GIS IMPLEMENTATION PLANNING  
SUFFOLK COUNTY WATER AUTHORITY - OAKLAND, NY  
Managed a large utility planning initiative to migrate data, systems, and users from an antiquated, engineering centric GIS to an enterprise-wide shared set of data and resources. Project centered around enabling data sharing between GIS and hydraulic modeling software. Conducted interviews, gathered facts and devised a plan to gain support for and execute the initiative.
- MUNICIPAL DESKTOP APPLICATION DEVELOPMENT  
CARTOGRAPHIC ASSOCIATES - LITTLETON, NH  
Developed over a dozen ESRI based desktop GIS applications for the municipal market. Major uses include parcel and land record management, permit management, cemetery management, electrical utility management, Water/Wastewater/Sewer management, and field data collection tools.
- UTILITY FOCUSED END USER INTERFACE DEVELOPMENT  
REGIONAL WATER AUTHORITY - NEW HAVEN, CT  
Collected and analyzed end-user requirements for an enterprise-wide GIS application at a water utility serving over one hundred thousand customers. Prototyped and built an intuitive desktop based application to assist cross-departmental collection, use and sharing of critical information. The software platform now boasts six major add-on modules, a user community of over one hundred people and a lifespan of over seven years.

- MUNICIPAL RICH INTERNET APPLICATION ARCHITECT  
CARTOGRAPHIC ASSOCIATES – LITTLETON, NH

Designed and developed a Silverlight based front end to a cloud based server infrastructure for municipal users to gain easy, up-to-date access to land records. Architected the backend database structure and server implementation as well as the procedural workflow for data population and update. Currently in use at nearly 150 municipal sites.

- COMPUTER AIDED MASS APPRAISAL SOFTWARE  
VISION APPRAISAL SOFTWARE - MARLBOROUGH, MA

Developed a .Net based GIS module for one of the nation's largest CAMA software vendors. Functions range from simple map production to complex query and analysis. A special emphasis was placed on user configuration and ease of use.

- GIS NEEDS ASSESSMENTS  
VARIOUS CLIENTS - NEW ENGLAND

Participated in several municipal and utility based GIS needs assessments. Involves face-to-face interviews, hardware and software evaluations and recommendations, database architecture and user interface prototyping.

- FLUVIAL GEOMORPHOLOGY ASSESSMENT APPLICATION  
STATE OF VERMONT - WATERBURY, VT

Designed and built an extensive toolset for the State of Vermont to analyze the erosion potential of the state's rivers. Major functionality includes the input of field observational data, the remote capture of river and valley structure and statistical subwatershed analysis. Final product output includes a scientifically significant buffer zone around investigated rivers which denotes its erosion potential. This information is ultimately used by state and local governments to direct the development and funding of infrastructure projects away from these erosion zones.

## PROFESSIONAL PROFILE

Mr. Fairhurst founded Fairhurst Professional Services, LLC in 2002 as an avenue to pursue his interest in system design and development. He has almost twenty years' experience in applying Geographic Information Systems (GIS) and Information Technology (IT) to government, utility, and business clients.

After working with Cartographic Associates, Inc. for more than six years, the two firms decided to join forces to better collaborate and focus on GIS development and deployment projects aimed at the New England municipal and utility markets.

# SANDRA BUTSON

QA/QC COORDINATOR  
SENIOR PROJECT MAPPER  
CAI Technologies

## EDUCATION

Wentworth Institute of Technology  
Boston, Massachusetts  
Certificate - Architectural Drafting Technology - 1980

New Hampshire Technical College  
Concord, New Hampshire  
Certificate - Landscape Design - 1987

## RELEVANT EMPLOYMENT

2002 -	Cartographic Associates, Inc. dba CAI Technologies Littleton, New Hampshire QA/QC Coordinator Senior Project Mapper <a href="mailto:sbutson@cai-tech.com">sbutson@cai-tech.com</a>
1992 - 2002	Cartographic Associates, Inc. Littleton, New Hampshire Senior Project Mapper
1988 - 1992	Cartographic Associates, Inc. Littleton, New Hampshire Project Mapper
1986 - 1988	Normandeau Engineers, Inc. Concord, New Hampshire Drafting Supervisor
1980 - 1986	Dubois & King Inc. Randolph, VT Senior Draftsperson

## CONTINUING EDUCATION

July 1992	National Career Workshops Seminar How To Organize And Manage Priorities Manchester, NH - 8 hours
Sept 1997	GPS Workshop Woburn, MA
Fall 1998	Introduction to AutoCAD Release 14 NH Technical College, Littleton, NH
Nov 1999	Lessons in Leadership Seminar Manchester, NH
Aug 2009	How to be an Outstanding Communicator
Sept 2010	ESRI Training - Getting Started with GIS, ArcGIS Desktop

## PROFESSIONAL PROFILE

In her previous experience, Mrs. Butson has been responsible for the scheduling and supervision of all phases of drafting projects. This includes reducing and plotting field survey notes, road design, developing drafting standards, and many other aspects of engineering and surveying.

As Senior Project Mapper, Mrs. Butson has also been responsible for the coordination and scheduling of parcel mapping projects, as well as the coordination between mapping projects and other projects within the company. On her assigned projects, she has taken the job from preliminary data collection and research stages through the boundary line compilation to the final parcel numbering, database reconciliation and quality control. Further, she has had experience in updating maps for several communities.

Mrs. Butson has also participated in the firm's GPS data collection efforts. She was instrumental in capturing water system features for CAI's Exeter, NH water system GIS project. Her willingness to learn and her perseverance on projects are valuable assets.

At Cartographic Associates, Mrs. Butson is the firm's Quality Control Coordinator. She is responsible for checking every map that is developed before delivery to clients. The maps are reviewed for aesthetics as well as for completeness and accuracy. Mrs. Butson has developed manual and automated procedures to assure our clients of receiving the highest quality products at the most reasonable costs.

In recent years she has taken advantage of her AutoCad training to assist in the firms map maintenance production.

Listed below are towns in which Mrs. Butson has been actively involved with parcel mapping projects:



MASSACHUSETTS

Athol  
 Conway  
 Deerfield  
 Douglas  
 Easthampton  
 Essex  
 Florida  
 Framingham  
 Franklin  
 Freetown  
 Groton  
 Hatfield  
 Heath  
 Lunenburg  
 Millville  
 Monterey  
 New Marlborough  
 New Salem  
 Orange  
 Otis  
 Petersham  
 Rowe  
 Savoy  
 Southwick  
 Sterling  
 Stockbridge  
 West Boylston  
 Westminster  
 Westport  
 Williamstown

NEW HAMPSHIRE

Allenstown  
 Antrim  
 Acworth  
 Barrington  
 Belmont  
 Berlin  
 Brentwood  
 Bristol  
 Canterbury  
 Center Harbor  
 Charlestown  
 Colebrook  
 Concord  
 Coos County  
 Deerfield  
 Deering  
 Dorcheseter  
 Effingham  
 Exeter  
 Gilmanton  
 Grantham  
 Holderness  
 Keene  
 Laconia  
 Lempster  
 Lincoln  
 Littleton  
 Lyman  
 Lyndeborough  
 Madison  
 Moultonboro  
 New Durham  
 New London  
 Newport  
 Northumberland  
 Northwood  
 Ossipee  
 Plainfield  
 Plymouth  
 Richmond  
 Rochester  
 Salisbury  
 Sugar Hill  
 Stark  
 Stewartstown  
 Stratford  
 Sunapee  
 Tamworth  
 Wakefield  
 Waterville Valley  
 Warren  
 Woodstock

VERMONT

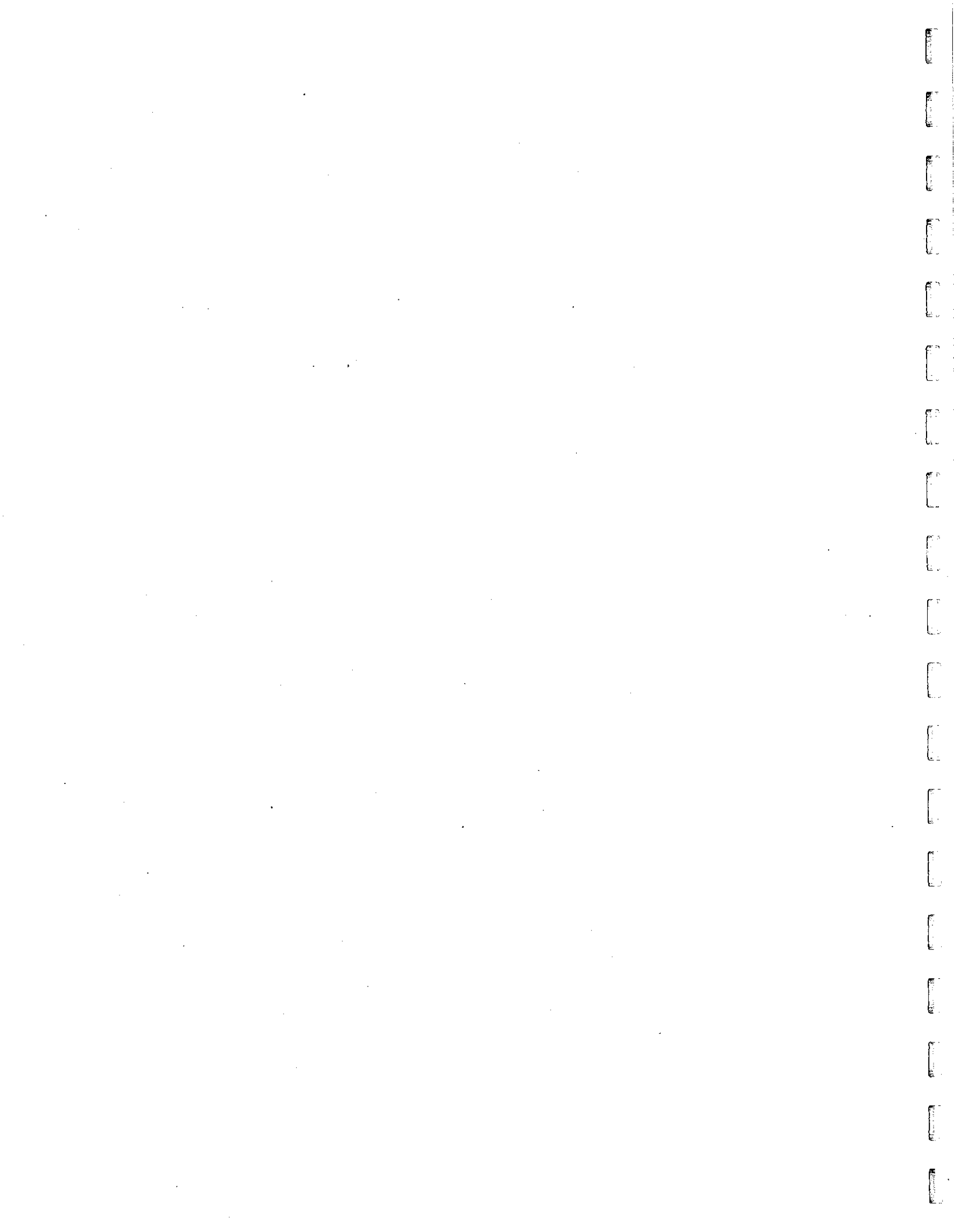
Bloomfield  
 Bradford  
 Cavendish  
 Chittenden  
 East Haven  
 Glover  
 Guildhall  
 Groton  
 Isle La Motte  
 Ludlow  
 Maidstone  
 Moretown  
 Newbury  
 Newport City  
 Pawlet  
 Plymouth  
 Rupert  
 South Hero  
 St. Johnsbury  
 Thetford  
 West Fairlee

MAINE

Acton  
 Bath  
 Camden  
 North Haven

CONNECTICUT

Killingly  
 Lebanon  
 No. Stonington  
 Preston  
 Westbrook



# DONALD BUTSON

## FOUNDER

CAI Technologies

## RELEVANT EMPLOYMENT

02/2011 - Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
Founder  
dbutson@cai-tech.com

11/1999 - 02/2011 Cartographic Associates, Inc.  
Littleton, New Hampshire  
President & Treasurer

07/1989 - 11/1999 Cartographic Associates, Inc.  
Littleton, New Hampshire  
Executive Vice President & Corporate Secretary

04/1985 - 06/1989 Cartographic Associates, Inc.  
Littleton, New Hampshire  
Vice President

01/1985 - 04/1985 C.T. Male Associates, Inc.  
Littleton, New Hampshire  
Assistant Manager, Mapping Division

08/1983 - 12/1984 Gordon E. Ainsworth & Associates, Inc.  
Littleton, New Hampshire  
Assistant Manager, Mapping Division

03/1982 - 07/1983 Gordon E. Ainsworth & Associates, Inc.  
Littleton, New Hampshire  
Mapping Consultant

## CONTINUING EDUCATION

April 1986 - NH Land Surveyors Association Seminar on Roads  
Railroads and Rights of Way, Concord, NH

Dec 1986 - NH Land Surveyors Association Seminar on  
Boundary Control and Legal Principles,  
Concord, NH 8 hours

Dec 1987 - Padgett-Thompson Seminar on Managing People,  
Burlington, VT 8 hours

Sept 1988 - ACSM National Conference at Virginia Beach

Dec 1991 - Principles of Accounting 3 credits  
AutoCAD  
Lessons in Leadership

## PROFESSIONAL PROFILE

Mr. Butson has extensive experience in the production aspects of tax maps including deed research, plotting property lines, developing index systems, and contact with property owners. He has worked in over 200 towns in all New England states.

As Assistant Manager, Mapping Division of the Ainsworth-Male firm, he was responsible for the training of new employees, marketing, project mapper on Vermont projects, and office manager of a satellite office in Littleton, New Hampshire. Mr. Butson has attended public hearings, as well as given presentations to various Boards and Town Meetings.

As Executive Vice President of Cartographic Associates, Mr. Butson was the principal responsible for all parcel mapping projects. Mr. Butson continues to remain actively involved in various aspects of parcel mapping projects including data acquisition, record research, and map compilation

Mr. Butson has testified as an expert witness on behalf of a municipality's successful lawsuit against the careless and negligent work of another mapping contractor.

Mr. Butson has also participated in a training seminar for the New Hampshire Department of Revenue's Property Appraisal Division's field appraisal staff in the production and use of tax maps. He has implemented an in house project data base management system which is highly beneficial to assure client satisfaction.

The following towns are examples of municipalities in which Mr. Butson has had direct, personal influence in the development or maintenance of successful mapping systems. They may be contacted as professional references.

MASSACHUSETTS

Adams  
Ashby  
Belchertown  
Cheshire  
Dalton  
Deerfield  
Douglas  
Easthampton  
Essex  
Florida  
Framingham  
Franklin  
Freetown  
Groton  
Lanesborough  
Monroe  
Richmond  
Sterling  
Warwick  
Westminster  
Westport

CONNECTICUT

Killingly  
Lebanon  
N. Stonington  
Preston  
Westbrook

NEW HAMPSHIRE

Allenstown  
Barrington  
Belmont  
Bethlehem  
Brentwood  
Conway  
Dalton  
Danbury  
Deerfield  
Deering  
Effingham  
Exeter  
Franklin  
Grantham  
Hale's Location  
Hart's Location  
Haverhill  
Holderness  
Keene  
Laconia  
Littleton  
Lyman  
Madison  
Moultonborough  
New London  
Northwood  
Plainfield  
Plymouth  
Richmond  
Rochester  
Salisbury  
Sunapee  
Wakefield  
Whitefield

RHODE ISLAND

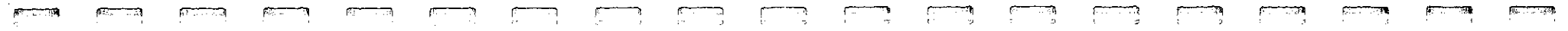
Coventry

MAINE

Acton  
Bath  
Camden  
South Berwick

VERMONT

Andover  
Athens  
Bloomfield  
Bradford  
Brattleboro  
Cavendish  
Dorset  
East Montpelier  
East Haven  
Fair Haven  
Fairfield  
Glover  
Groton  
Isle La Motte  
Lunenburg  
Marlboro  
Moretown  
North Hero  
Newport City  
Pawlet  
Peru  
Plymouth  
Rupert  
Richmond  
Roxbury  
St. Johnsbury  
Stratton  
Troy  
Winhall



# RHONDA CARON

CAD/GIS ANALYST  
CAI Technologies

## EDUCATION

New Hampshire Technical College, Berlin, NH – Associates Degree in Applied Science

University of New Hampshire, Durham, NH – Major: Civil Engineering

## RELEVANT EMPLOYMENT

2000 - Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
AutoCAD/GIS Maintenance Analyst  
[rcaron@cai-tech.com](mailto:rcaron@cai-tech.com)

1999 - 2000 American Paper Mills of Vermont  
Administrative Assistant

1992 - 1999 Simpson Paper Company  
Computerized Maintenance Management System Manager/  
Maintenance and Engineering Secretary

1983 - 1992 Timberland Machine Inc.  
Marketing Services Manager / Customer Service/Parts Clerk

## CONTINUING EDUCATION

AutoCAD LT for Windows  
MAPCON/Advanced Revelations (DFM Systems, Inc.)  
ISO 9002 – Internal Auditors Training  
International Correspondence School – Electrical and Electronic Components and Systems; Power Distribution  
National Electrical Code Update Seminar (NHTC – certificate)  
Various Supervisory and Communication Seminars (Fred Prior – certificate)  
Getting Your Point Across (Zenger Miller Seminar)  
Adobe Photoshop & Illustrator  
ArcVIEW 3.2  
AutoCAD 2000  
AutoCAD 2011 Essentials  
ArcGIS I & II  
Basics of the Geodatabase Data Model  
Building Geodatabases I  
Getting to Know Model Builder  
Creating and Editing parcels in ArcGIS  
ESRI: Data Management  
Migrating Coverages into the Geodatabase

## PROFESSIONAL PROFILE

Ms. Caron has extensive experience using AutoCAD, Adobe and ArcGIS software to develop and maintain municipal tax map data in digital format. She also possesses considerable knowledge of spreadsheet and database systems used to maintain related tabular/attribute data. Ms. Caron is experienced with state level GIS data requirements for all New England states.

Major responsibilities include development of GIS data sets for clients based on their municipal tax map data, data development, setup and training for the CAI Query Manager software, overseeing the maintenance of municipal E-911 street numbering systems, data preparation for GPS data collection projects and provide technical support to clients. She is the primary analyst responsible for the ongoing maintenance of hundreds of municipal property maps. She provides training of all new CAD and GIS technicians, and oversees digital data maintenance and procedures to ensure client data is accurate, complete and current. Specific clients for whom Ms. Caron handles the ongoing maintenance of E-911 systems and CAI Query Manager software include the following:

### NEW HAMPSHIRE

Alexandria  
Barrington  
Bridgewater  
Bristol  
Canterbury  
Carroll  
Charlestown  
Coos County  
Easton  
Franconia  
Gilford  
Gilsum  
Grantham  
Hampton  
Haverhill  
Hopkinton  
Jaffrey  
Laconia  
Landaff  
Lisbon  
Madison  
Monroe  
Moultonborough  
New London  
Plymouth  
Richmond  
Springfield  
Stoddard  
Sugar Hill  
Tamworth  
Wakefield  
Warren  
Washington  
Waterville Valley

### MASSACHUSETTS

Adams  
Athol  
Attleboro  
Bolton  
Cheshire  
Chilmark  
Conway  
Dalton  
Deerfield  
Douglas  
Dudley  
Franklin  
Freetown  
Hubbardston  
Millville  
Monterey  
Stockbridge  
Uxbridge  
Warren  
Watertown  
West Boylston

### MAINE

Acton

### VERMONT

Brattleboro  
Colchester  
East Haven  
Fairlee  
Lunenburg  
Newport City  
Thetford  
Weston



Specific clients for whom Ms. Caron developed the original GIS database include the following:

NEW HAMPSHIRE

Acworth  
Antrim  
Center Harbor  
Charlestown  
Colebrook  
Concord  
Dorchester  
Gilmanton  
Keene  
Lempster  
Lincoln  
Littleton  
Lyman  
Lyndeborough  
Moultonborough  
New Durham  
New London  
Newport  
Northumberland  
Ossipee  
Plymouth  
Stewartstown  
Wakefield  
Warren

MASSACHUSETTS

Auburn  
Essex  
Hubbardston  
Lunenburg  
Monterey  
Petersham  
Rowe  
Southwick  
Stockbridge  
Uxbridge  
Washington

MAINE

Acton  
North Haven

VERMONT

Chittenden  
East Haven  
Glover  
Groton  
Moretown  
Rupert



# LUKE UHLMAN

GIS Analyst  
CAI Technologies

## EDUCATION

Dalhousie University 1992-1996  
Bachelor of Science  
Halifax, Nova Scotia

College of Geographic Sciences 1997-1999  
Associates Degree, Digital Mapping (Honors)  
Lawrencetown, Nova Scotia

## RELEVANT EMPLOYMENT

11/2014 - Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
GIS Analyst  
[luhlman@cai-tech.com](mailto:luhlman@cai-tech.com)

08/2000 - 11/2014 James W. Sewall Company  
Old Town, Maine  
Maintenance Lead

## SOFTWARE

ESRI ArcGIS, Desktop Suite, ArcGIS Online, AutoCAD, Microsoft Office Suite, GoTo Meeting, Join.me, Goldmine, Adobe Photoshop, Adobe Professional.

## PROFESSIONAL PROFILE

Mr. Uhlman is a Geospatial professional with 15 years' experience working with state, county and municipal government clients in New England, New York, Georgia and Mississippi. With a client focused approach in mind, working with them to provide leading edge solutions for design, implementation and ongoing technical training and support for their evolving geospatial needs.

Mr. Uhlman has specific experience in:

Geospatial Needs Assessments

- Remote and on-site evaluations of geospatial data and interviewing key organizational players
- Preparation of Needs Assessment final report

Data Conversion

AutoCAD, ArcINFO Coverage, Shapefile and raster to vector conversion of tax maps and surveys into geodatabase format.

Geodatabase design

- Feature class creation
- Polygon topologies
- Feature linked annotation
- Relational databases
- Imagery datasets

#### Automated Plotting Routines (Data Driven Pages)

- Design from scratch

#### Quality Assurance

- Verifying data meets state compliance standards and contract specifications through automated and visual QA/QC routines
- Geodatabase schema compliance checking
- Visual and automated QA/QC of sub-contractor submitted datasets and communicating issues for re-submission

#### Data Editing

- Parcel polygons compiled from deeds, surveys, heads up digitizing and COGO to an orthoimage and planimetric basemap
- Recompilation of existing parcel polygons to align with state orthophotography
- Parcel polygon maintenance using recorded record information
- Linking parcel polygons to CAMA database extracts and preparing mismatch reports
- Creation and maintenance of landbase overlays to spatially align existing parcel polygons;
- Zoning districts, Shoreland Zoning and Land Use feature layer development

#### Ongoing remote client technical support and training

#### Digital Orthophotography

- Scanning analog film into TIFF format
- Orthophoto production
- Orthomosaic production
- Orthomosaic QA/QC and editing

# SANDRA ROSSI

OFFICE/DATABASE MANAGER  
CAI Technologies

## EDUCATION

University of New Hampshire - B.A. 1986  
Durham, New Hampshire

## RELEVANT EMPLOYMENT

04/1992 - Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
Office/Database Manager  
srossi@cai-tech.com

10/1991 - 04/1992 Cartographic Associates, Inc.  
Littleton, New Hampshire  
Secretary/Receptionist

07/1991 - 09/1991 White Mountain Cycle & Marine  
Littleton, New Hampshire  
Parts Manager

08/1988 - 06/1991 White Mountain Cycle & Marine  
Littleton, New Hampshire  
Office/F&I Manager

04/1987 - 07/1988 Indian Head Bank North  
Littleton, New Hampshire  
Credit Clerk/Teller

01/1987 - 04/1987 Loon at Lincoln Audio Viceo  
Lincoln, New Hampshire  
Video Manager

09/1983 - 12/1986 University of New Hampshire/Ocean Process Analysis Lab  
Durham, New Hampshire  
Secretary/Bookkeeper

## CONTINUING EDUCATION

Microsoft Access  
Microsoft FoxPro  
Microsoft PowerPoint  
Microsoft Project  
Microsoft Windows  
Microsoft Word  
Novell Netware for End Users  
Local Area Networks  
Time Management Workshop - NH. Tech College, Littleton, NH

## PROFESSIONAL PROFILE

Mrs. Rossi's knowledge of computer software ranges from Microsoft Office (Word, Access, Excel, PowerPoint), Visual dBase, FoxPro, QuickBooks, WordPerfect, and Works, as well as an intimate knowledge of database technologies such as SQL and ODBC connectivity.

Her database responsibilities include working with each client to obtain and create a database which is workable for CAI, the client, and, in most cases, the client's CAMA vendor. This often requires data manipulation/conversion and problem solving. After the initial database is set up, she then oversees each project to ensure that data quality and integrity are maintained throughout the project.

Mrs. Rossi has been the principal person responsible for the organization and formatting of all proposals, contracts, reports, etc., as well as the formatting and layout of our company newsletter. Her word processing/office responsibilities include providing assistance in working with the various softwares using the capabilities available to produce documents in the most efficient, presentable, and organized manner possible.

As part of her on-going professional development, Mrs. Rossi is involved in the post-processing of GPS data for GIS projects. She is responsible for coordinating all textual database integration efforts with the firm's GIS department. Mrs. Rossi is expert at creating solutions for cumbersome database problems.

# TERRI PARKS

TECHNICIAN, REPROGRAPHIC SERVICES  
CAI Technologies

## RELEVANT EMPLOYMENT

1990 - Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
Technician, Reprographic Services  
[tparks@cai-tech.com](mailto:tparks@cai-tech.com)

1988 - 1990 Cartographic Associates, Inc. dba CAI Technologies  
Littleton, New Hampshire  
Mapping Technician

1981 - 1988 Manchester Knitted Fashion  
Garment Production

1979 - 1980 U.S. Forest Service  
White Mountain National Forest, New Hampshire  
Timber Management, Trail Maintenance

## PROFESSIONAL PROFILE

Mrs. Parks has been involved in the organizing and indexing of data necessary to complete mapping projects, deed research including abstracting and plotting parcel descriptions, map compilation including the fitting of legal descriptions to base maps and reconciling same with physical evidence, and parcel numbering. She has also worked on numerous map updating projects involving parcel splits, generating new numbers and areas, and revisions of the cross index system. Further, Mrs. Parks has done field work in contacting property owners to assist in the accurate pinpointing of their property lines on aerial photographs, and has attended public hearings upon completion of projects.

Towns in which Mrs. Parks has been involved in mapping include:

### MASSACHUSETTS

Belchertown  
Colrain  
Conway  
Hinsdale  
New Salem  
Richmond  
Russell  
Williamstown

### NEW HAMPSHIRE

Alton  
Charlestown  
Columbia  
Dalton  
Hopkinton  
Moultonborough  
Wakefield

### VERMONT

Ludlow  
Lunenburg  
St. Johnsbury  
Thetford

In the Reprographic Services department, Mrs. Parks is responsible for all aspects of map printing and reproductions using a Xerox engineering scanning and copying system. She calculates and determines all scale adjustments necessary to provide enlargements and reductions for both in house purposes as well as "over the counter" requests by customers. When color plots are required, a Hewlett-Packard color plotter is utilized.

At present, the Xerox 510 Wide Format Copy System) is the equipment of choice for nearly all monochrome copying and printing needs. The Xerox 510 consists of a printer and a controller module, which allows for jobs to be sent from the operator's computer over the interoffice network to the printer. Copies can be made up

to 36" wide on a choice of media. Reductions and enlargements range from 25 to 400 percent of the original document. Useful features include mirror imaging and inverting, which reverses the old style white image on a dark background, to a black image on a white background.

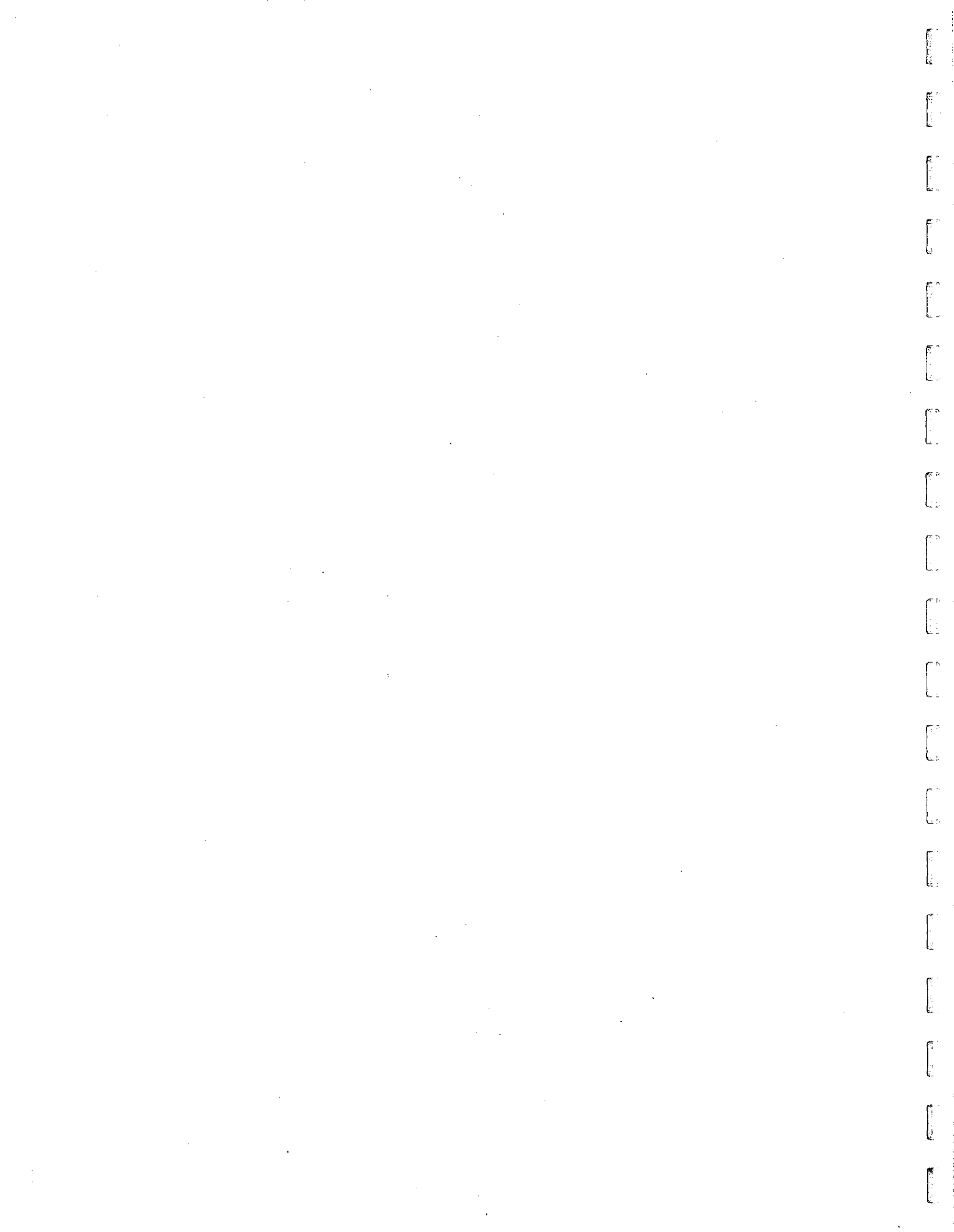
Engineering sized documents can also be scanned and saved as image files for archiving or later use. Mrs. Parks is also responsible for ordering all reprographics supplies and media, indexing and archiving project data, and company shipping of project deliverables.

Through her experience in the Reprographics Department Mrs. Parks has become familiar with our clients' maps and their features. This has proved beneficial, as she often assists with Quality Control by reviewing maps for aesthetics and accuracy before they are delivered to clients.

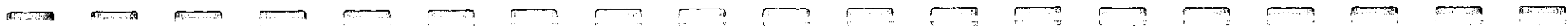


## APPENDIX B – CLIENT REFERENCES

CLIENT	PROJECT DETAILS
<p>North Haven, ME                      Tammy Brown, Assessors Agent                      P.O. Box 400                      North Haven, ME 04853</p> <p>207-867-4433</p>	<p>Completed 11/2018, 660 parcels, New tax maps in GIS format and implemented AxisGIS platform.</p>
<p>Petersham, MA                      Kelly Garlock, Assistant Assessor                      Town Hall, 3 South Main Street                      Petersham, MA 01366</p> <p>978-724-6658</p>	<p>Completed 04/2017, 850 parcels, New tax maps in GIS format</p>
<p>Heath, MA                      Alice Wozniak, Assessors Clerk                      1 East Main Street                      Heath, MA 01346</p> <p>413-337-4934</p>	<p>Completed 03/2019, 950 parcels, New tax maps in GIS format.</p>
<p>Dorchester, NH                      Margaret Currier-Lemay                      1021 NH Rte 118                      Dorchester, NH 03266</p> <p>603-523-7119</p>	<p>Completed 09/2018, 500 parcels, New tax maps in GIS format.</p>
<p>Glover, VT                      Ned Andrews, Lister                      51 Bean Hill Road                      Glover, VT 05839</p> <p>802-525-6227</p>	<p>Completed 07/2016, 900 parcels, New tax maps in GIS format.</p>
<p>Keene, NH                      Daniel Langille, City Assessor                      City Hall, 3 Washington Street                      Keene, NH 03431</p> <p>603-352-2155</p>	<p>Completed 06/2018, 7900 parcels, New tax maps in GIS format, scanned and linked all plans and implemented AxisGIS platform.</p>
<p>Moretown, VT                      Mike Woods, Lister                      79 School Street                      Moretown, VT 05660</p> <p>802 241-8200</p>	<p>Completed 09/2018, 875 parcels, New tax maps in GIS format and implemented AxisGIS platform.</p>
<p>New London, NH                      Norm Bernaiche, Assessor                      275 Main Street                      New London, NH 03257</p> <p>603 526-1248</p>	<p>Completed 12/2018, 2800 parcels, New tax maps in GIS format.</p>



# APPENDIX C – PROPOSED MAP SCALE BOUNDARIES



# PROJECT EXAMPLES

Keene, NH - Index Map

Keene, NH - Tax Map #107

Keene, NH - Tax Map #237

Keene, NH - Composite Map

