

VT Center for Geographic Information

Vermont GIS Parcel Mapping Guideline

Version 2.0



Vermont Center for Geographic Information
A Division of the Agency of Commerce and Community Development

Updates

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These individuals volunteered their time on a monthly basis for over 2 years to hammer out a new GIS Parcel Data Standard and Guideline for use by the VT mapping community. Their tenacity, generosity, and thoughtful participation was **essential**, and very appreciated!

Version 2.0 of this guideline was edited by VCGI and VTrans staff and reviewed by the Enterprise GIS Consortium, as well as posted for public review for 30 days.

Statutory Authority and Standard Review/Approval

The Vermont Center for Geographic Information (VCGI) has the statutory authority¹ to craft and adopt VT GIS standards and guidelines. Over the past 20+ years, VCGI has worked with the VT GIS community to carefully craft these standards and guidelines, helping to ensure that Vermont GIS (VGIS) data “is compatible with, useful to” others in the VT GIS community.

In 2015, VCGI was reformed as a Division under the Agency of Commerce and Community Development (ACCD) as defined in H.885 Sec. E. 800.1 10 V.S.A. § 122. VCGI's duties did not change, and therefore VCGI still has the authority to adopt VT GIS standards and guidelines.

The State’s Enterprise GIS Consortium (EGC) has been established as the organization responsible for reviewing and approving Vermont GIS standards crafted by VCGI (in collaboration with the Vermont GIS Community).

¹ <http://legislature.vermont.gov/statutes/fullchapter/10/008>

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April 2017

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Introduction

Parcel maps (also referred to as tax maps or property maps) and the digital geographic data used to make them (GIS data) are among the most important local government information assets a town owns. They are a fundamental base for many municipal activities. GIS parcel data is NOT the equivalent of legal property records or land surveys, but the data does assist municipal officials with functions such as accurate property tax assessment, conservation, planning and zoning. Towns can link their maps to their Grand Lists and display local information. Officials can show taxpayers how proposed development or changes in municipal services and regulations will affect them and their neighbors. In many towns, parcel data also helps to provide public notices, plan bus routes, and carry out other municipal services.

The principal responsibility of the lister or assessor is to inventory and appraise all property at Fair Market Value (FMV). In order to appraise at FMV, a lister must be able to accurately locate the parcel and determine the size and shape. A complete set of Property Maps is highly advantageous to perform this function. Municipal property mapping efforts should try to support the needs of all municipal agencies in an effort to combine cost sharing benefits.

Adequate preparation is essential prior to entering any contract for parcel mapping services. The municipality needs to evaluate its needs for listers, planning professionals and volunteers, zoning administrators, and public works staff, all of whom will benefit from using the final product. Major considerations include the type of product and accuracy, evaluating existing resources of personnel, facilities, data processing, technical and administrative support, and determining funding and parcel data maintenance plans. Contact your Regional Planning Commission or VCGI for information on HOW to start using the data.

Purpose

This guideline will identify aspects of the parcel mapping process, issues to consider, and provide template documents that will assist listers, assessors, and other town officials with their duties as they relate to the development of parcel maps and data. An overview of the process is provided before the template documents. Please refer to the current VT GIS Parcel Data Standard at the VCGI web site (vcgi.vermont.gov) for technical specifications relevant to the creation or update of the parcel data used to create maps.

Overview of the Parcel Mapping Process

Now that you have read through the descriptions of relevant issues and processes, let's look at an overview of the steps involved in the process of creating or updating parcel maps and the data used to create them.

1. Town officials decide to create or update tax maps, and recognize the importance of creating or updating the digital parcel data that is integral to tax maps. Town officials read this Parcel Mapping Guideline in order to understand best practices in this process.
2. Town officials sit down together to discuss goals of the mapping project. We recommend that **various town officials and volunteers** be included in this discussion, as maps and map data can be useful to a town in a variety of ways: Listers are obviously interested in boundary locations, acreage, and abutters; Zoning officials would be interested in setbacks, acreages, and locations of planned development; Planners are interested in the big picture and how the different areas of town are used; Conservation commission members might want to identify the locations of wildlife sitings, important natural resources, and trails. These are just a few examples.
3. After identifying the goals of the project, and thereby the products of the project (so many maps that show these features, as well as digital parcel data and zoning data and the natural resource inventory data, for example), Town officials would develop a more formal Request for Proposals (RFP) as described in this guideline. The RFP would contain as much specific detail as possible relating to the expectations and products of the project. See Appendix A.
4. The RFP would be disseminated in various ways: posted at the town website, sent via an email listserv (such as VGIS-L, coordinated by VCGI), or simply mailed to a selection of companies who do mapping (VCGI maintains a list of mapping firms who work in VT).
5. Proposals would be received by the indicated deadline, and town officials (hopefully, with the help of Regional Planning Commission staff, professional planning staff, or someone with knowledge of GIS) would review them and choose a mapping contractor based on an agreed upon set of criteria. See Appendix C.
6. Once the potential contractor has been notified, the town would draw up a mapping contract that specifies deliverables, timelines, payments, etc. This document is extremely important as it protects both the town and the contractor from misunderstanding and disappointment. See Appendix B and Appendix D.
7. Payment should be tied to the achievement of milestones or provisions of products as agreed upon in the contract. See Appendix E and Appendix F.

8. Once the project is complete and all products have been received, the contract can be closed and the contractor can be paid their final payment.
9. A copy of the parcel data (and any other data developed or updated during the project) should be shared with your RPC GIS specialist, as this data is integral to regional planning, and your town benefits from the RPC using up to date data. The RPC and VCGI can also help by distributing this important public information when members of the public request it.
10. Now is a good time to make sure everyone in the town office has access to the maps and data developed. In addition, town officials can discuss a plan for maintenance or update of the maps and data. Every year? Every 3 years? Make a plan and include the financing for that plan in town budgets as appropriate.

Contracting For Mapping Services

When considering a new mapping program, or a major update to an existing property mapping program, the following contracting considerations are advised. Please see the final section of the guideline before the Appendices, "An Overview of the Tax Mapping Process," for specific identification of the steps involved and when each of the items or activities below come into play.

REQUEST FOR PROPOSALS

When contracting for mapping services, it is recommended that the municipality use the sample Request for Proposal (RFP) in Appendix A with technical specifications. A vendor should not be selected on the basis of cost alone.

TECHNICAL SPECIFICATIONS

The municipality must prepare a set of technical specifications that clearly defines the mapping services to be performed. The specifications should address the technical aspect of the project and specify the quality and quantity of the products to be delivered. The specifications should include such items as geographic area to be mapped, types of maps to be produced, data to be displayed on the maps, data to be delivered and its format, source of data, labeling, deed records and technical reports. Sample specifications are given in Appendix B and should follow standards when applicable; the Vermont Parcel Data Standard provides specifications for digital parcel data (see the Resources/Standards section of VCGI's web site vcgi.vermont.gov).

EVALUATING MAPPING FIRMS

A level of technical expertise is required to evaluate mapping professionals and contract proposals. If the expertise is not available at the municipal level, the Regional Planning Commission can help in providing such assistance. Mapping professionals can be evaluated using the conditions given in Appendix C.

PARCEL MAP AGREEMENT

Appendix D contains a sample Parcel Map Agreement which can be used as part of the contract established between the municipality and mapping firm.

SCHEDULE OF PAYMENTS

Appendix E contains a sample Schedule of Payments which can be used as part of the contract established between the municipality and the mapping firm.

Orthophotography (Base Maps)

An **orthophoto** is an aerial photograph that has been rectified such that it is equivalent to a map of the same scale. It is a photographic map that can be used to measure distances relative to the projection of the orthophoto. The state of Vermont funds the collection of orthophotos with the following specifications in order to support municipalities' creation of tax maps and digital parcel data. *The most recent State of Vermont orthophotos should be used as the base map and minimum level of accuracy for the development and improvement of tax maps and digital parcel data.*

The Vermont Center for Geographic Information (VCGI) has acquired base map digital orthophotos for the entire state. These orthophoto base maps are available in digital form at no cost to all municipalities in VT. In addition, municipalities can request paper copies of these orthophotos from their Regional Planning Commission at no or nominal cost. VCGI is annually updating these images for a portion of the state in an on-going rotation. Please see the VT Imagery Program web page at VCGI's web site for the age and availability of historic and current orthophotos as well as the future acquisition plan (vcgi.vermont.gov).

Municipalities that wish to have additional coverage (for example, higher resolution in village areas) can contact their Regional Planning Commission for assistance in requesting "buy-up areas."

From 2011 to 2014 (Vintage 3) the images collected can be described in the following manner:

- Black and White, Color, and Near Infrared are available
- Collected after the snow melts and before the trees leaf out in the spring
- Horizontal accuracy: ASPRS Class I horizontal accuracy of +/- 1 meter RMSE (for both X and Y) for Statewide 50cm pixel resolution.

Vintage 4, which will be collected between 2015 and 2020 can be described in the following manner:

- Statewide 30cm pixel resolution. 15cm pixel resolution for a sub-set of "buy-up" areas.

- Black and White, Color, and Near Infrared will be available
- Collected after the snow melts and before the trees leaf out in the spring
- The horizontal accuracy of the Vintage 4 (2016-2020) orthoimagery meets 30cm and 15cm (buy-up areas only) horizontal accuracy standards specified in ASPRS's Positional Accuracy Standards for Digital Geospatial Data specification. This equates to +/- 73.4 cm RMSE (for both X and Y at 95% confidence level) for this 30cm ground sample distance (GSD) imagery and +/- 36.7 for 15cm GSD "buy-ups", and is designed for "standard mapping and GIS work" as specified within ASPRS's specification. More info here:
http://www.asprs.org/a/society/committees/standards/ASPRS_Positional_Accuracy_Standards_Edition1_Version100_November2014.pdf

Land Records Research And Examination

The basis of any mapping project is good land records research. Often extensive research must be undertaken to obtain a good description of a parcel. This is essential to the overall accuracy of the project. Surveys exist, many done by Vermont Licensed Land Surveyors, that are not part of municipal records. Maximum effort should be employed to have all surveys (including digital survey files) incorporated into the mapping project.

METHOD

The method of choosing and examining the instruments of title shall be determined by the Municipality or their contractor; however, the methods developed shall provide for the following:

RECORDS RESEARCH

Records research shall be conducted to determine the survey, deed, or other means of description that defines, ideally, each and every parcel of property in the municipality. Deed research shall be coordinated with the existing Grand List. Every reasonable effort shall be made to obtain a survey, metes and bounds description, or other description of every parcel, with description source to be documented in the Discrepancies List (see below). To keep projects costs down, the town may need to provide assistance with research and/or prioritize the parcels on which this type of research is done if it is not feasible to perform this research for all parcels in the municipality under the project's given budget or schedule.

DISCREPANCIES LIST

Parcels and associated reports for which no record of conveyance or description has been located shall be submitted in a clearly organized document called the "Discrepancies List" - see more information below.

The information to be set forth shall be an accumulation of all the efforts made as part of the records research and follow-up procedure. The reports shall be organized and cross indexed by SPAN (School Property Account Number) and parcel identification numbers that correspond with the map.

Record Description And Survey Plotting

RECORD DESCRIPTION AND PLOTTING

The firm doing the mapping shall determine the method of plotting descriptions for all parcels in the municipality. The best available description should be used to plot each parcel. The best practice for plotting the property boundary descriptions is using Coordinate Geometry (COGO) to enter in the metes and bounds to create a closed traverse. If metes and bounds are not available, then the boundaries can be “heads up digitized” from a georeferenced image of the best available property map, if available.

PROBLEMS

After attempting to plot parcels which cannot be resolved by the contractor through record research, communication with municipal staff, and personal contact with the reputed owner, or other methods, the problem descriptions shall be documented for presentation to the municipality on the DISCREPANCIES List.

REPORT

The presentation of such problem descriptions shall include all relevant material including adjacent deeds, survey plots, and/or records, and a report containing the contractor’s explanation of the problem and their efforts to date to solve the problem. The contractor shall not be entitled to extra compensation for this work.

Discrepancies List

The Discrepancies List is important because it provides the municipality with complete documentation of the contractor’s findings. Parcels and associated reports for which no description has been located shall be submitted in a clearly organized document called the "Discrepancies List." The information to be set forth shall be an accumulation of all the efforts made as part of the record research and follow-up procedure. The reports shall be organized and cross indexed by SPAN and parcel identification numbers that correspond with the map.

The submittal of such report shall not necessarily relieve the contractor of their responsibility to continue efforts to map and identify the parcels properly. If, in the view of the municipality, the contractor has not used all the obvious and reasonably economical methods of approach, they shall request the contractor to do so at the contractor’s expense.

CREATION OF A DISCREPANCIES LIST

A Discrepancies List shall be prepared for the municipality by the contractor and it shall provide for the following:

CONTENTS OF THE DISCREPANCIES LIST

All Discrepancies Lists will be in the format previously agreed to by the municipality. These lists will be delivered in accordance with the contract delivery schedule. Master files of these lists will be kept current during the entire project and a composite listing in alphabetical or numerical order will be delivered to the municipality at the end of the project.

PROBLEM PARCELS

Parcels for which an adequate description could not be located or parcels not locatable on the map but which are currently assessed, should be set in the Discrepancies List.

PARCEL DISCOVERIES - OWNER KNOWN / OWNER UNKNOWN

Owner Known includes those parcels found and mapped by the contractor for which the owner's name is known but was not on the most recent Grand List. Owner Unknown (or unclear) are all parcels found and mapped by the contractor for which the true owner cannot be satisfactorily determined and which are not on the most recent Grand List. A list will be prepared which shows the SPAN, parcel number, map number, owner (if known), deed acreage and computed acreage. The list shall also show the total acreage of all such properties in the municipality.

Areas Database

A database will be prepared that includes SPAN, parcel identification number, calculated acreage, assessed acreage, as well as the percentage difference for each parcel in the municipality. This database serves as a tool to determine the need for additional research.

Items To Be Provided By The Municipality

GRAND LIST *and additional parcel information*

A digital version of the “working” Grand List will be provided for the contractor's use. And should include the following fields, at a minimum: SPAN, parcel identification number, legal acreage, owner name, land use code, last sale, deed book and page. This list should be in a format specified in the contract (preferably a spreadsheet or database format) and should also contain the “Inactive” parcel records with field that indicates the status (active vs. inactive).

EXISTING MAPS AND DATA

In preparing parcel maps, all existing tax maps, surveys, orthophotos, and similar maps (including relevant existing digital files, in particular any GIS or CADD format files and/or PDF or Image files) shall be made available to the extent practical and reasonable.

MUNICIPAL CLERK'S OFFICE

Records shall be made available for the contractor's use at no charge within reasonable working hours.

Public Viewing

Parcel maps are to be made available for viewing by the public prior to the conclusion of the contract. Details of availability of the contractor for the public viewing shall be agreed upon by the contractor and the municipality as set forth in the contract.

Deliverables

DELIVERY SCHEDULE

The municipality and the Contractor shall develop a delivery schedule, with cut-off dates for map updates (e.g., property lines, subdivision lines) for all the deliverable products of the project. Prior to preparation of the contract, the cut-off dates will be determined and included in the contract delivery schedule. Any extensions shall be agreed upon between the municipality and contractor, including specific dates.

DELIVERABLES

The contractor shall deliver to the municipality the following materials to be prepared according to the technical specifications found in the contract. **These materials become the property of the municipality as soon as they have been prepared:**

- 1 Documentation of source materials and information located during contract referenced to each parcel, as specified in the contract.
- 2 All digital parcel boundary layers in GIS data format with the naming convention relative to April 1 of the Grand List year in which the parcel work was performed - please refer to the VT GIS Parcel Data Standard for requirements related to GIS data and metadata.
- 3 If desired, hard copy parcel maps; number and size shall be specified in the contract and shall include an Index Map showing all map sheets with town boundary and roads.
- 4 All reports called for in the technical specifications, in hard copy and/or digital format, as specified in the contract.
- 5 Additional digital files relevant to the project, as specified in the contract.

Maintenance

Municipalities with digital parcel mapping are encouraged to develop an on-going maintenance program. This typically consists of adding new surveys or deeds and making parcel polygon boundary or attribute edits to the maps and GIS data. A one or two-year update cycle is recommended.

LONG-TERM

Maintenance of digital tax parcel data is detailed, technical, and time-consuming, therefore the idea of a municipality maintaining or updating its own parcel data should be evaluated carefully. In general, most Towns subcontract this work to the private sector. Issues to consider are:

- 1 Does the municipality have the personnel resources (volunteer or paid) in terms of time and skills to devote to periodic updates?
- 2 Does the municipality have the necessary computer hardware and software to do this work, and is there adequate space in the Town offices?
- 3 The adage applies: You get what you pay for.

If a municipality decides to utilize a consultant for updates, there are varying levels of support the Town can provide to the consultant in terms of time and materials. Depending on the level of Town involvement, training may be necessary to realize reduced costs. Adherence to time schedules are integral to success. Training includes, but is not limited to:

1. How to organize and deliver property transfer, subdivision, and survey information.
2. Techniques or protocols to edit and update the parcel data, and/or to generate paper tax maps from the updated GIS parcel data.
3. Data coding systems used, and most importantly, those for parcel numbers.
4. Techniques for review and how corrections will be done.

INTERIM MAINTENANCE

Contractors developing or revising a municipality's property map database shall maintain all data until all deliverable products are received and accepted by the municipality in accordance with the contract delivery schedule.

CONTRACTOR RESPONSIBILITIES - PROPERTY MAPS

The Contractor shall maintain the property maps until all products, digital or manual, are delivered to the municipality for final approval.

CONTRACTOR RESPONSIBILITIES - DISCREPANCIES LIST

The Contractor shall maintain the "Discrepancies List" of all parcel data, until all products, digital or manual, are delivered to the municipality for final approval.

Working With GIS Parcel Data

TRAINING

While it is possible to learn how to use computer-based tax parcel maps on one's own, training will speed learning and use, and helps ensure that all the advantages of the Town's investment are realized. A minimum level of training includes, but is not limited to:

- 1 How to run GIS software, link the Grand List to tax parcels, query for parcel attributes, and produce maps.
- 2 How to edit/update parcel data using GIS software, if desired.
- 3 How to organize data on the computer, use file naming conventions, and backup data.
- 4 How to acquire and load other GIS data.

The place and duration of training, number of trainees, and which computers will be used should be specified in the contract.

LINKING DATA

Each town's Grand List is a valuable database that can be used in many municipal applications. Joining the Grand List to a parcel map in a Geographic Information System (GIS) allows town officials to use the Grand List more efficiently in many applications. With the Grand List joined to the GIS data, town officials can query the Grand List by location and other variables. Examples of spatial queries include generating a list of addresses of abutters for a lot, creating a map of all properties owned by the state or creating a map of all lots with assessed values and/or sizes higher than a certain amount. Creating maps or address lists from paper maps could take days.

The numbering system on the map may be the town's Grand List code or a coding based on the map page, block, and lot known as TAXMAP (in NEMRC). In order to facilitate the link to the Grand List, the GIS Parcel Data Standard requires inclusion of the SPAN (a state-assigned unique number) in the attributes.

All property must have a unique record in the Grand List with a corresponding SPAN. This includes non-taxable lots owned by municipalities, the State of Vermont and non-profit organizations such as religious groups and land trusts. This allows the link between the digital parcel data and the Grand List. Land parcels associated with mobile home parks and condominiums may not be in the Grand List and therefore may not have a SPAN.

There are many other types of data that can be linked to parcel data. The state's E911 data will soon include the SPAN for that property, and this will facilitate linking of information contained in the E911 database (available from VCGI) such as site type (commercial, residential, public, etc.). Check VCGI's metadata for the E911 data or the E911 web site for more information about the attributes E911 maintains. And remember, it is the municipal E911 Coordinator who ensures that the E911 data is accurate and up-to-date.

INTEGRATION WITH OTHER GIS DATA

Integration refers to how geographic features in one GIS data layer match up, or align, with their counterparts in another data layer. For example, road centerlines from the Enhanced 9-1-1 program may or may not run up the center of the public road right-of-ways in parcel data. Or if the Town has zoning data, do zoning district boundaries which follow parcel boundaries match their parcel counterparts? One would expect these to match one another, but they often do not because they can originate from different sources.

The question of integration or data coordination becomes one of which data layer will be the benchmark to which the others will be compared. Tax parcels are the fundamental land management unit for municipal government, and are the revenue base for the Town's functions. Thus tax parcels should be the benchmark data layer for the Town's GIS. Having all the Town's GIS data match perfectly is not required (it is an imperfect world after all), but when questions arise when two data layers showing the same feature don't agree, the tax parcel data should be given preference, unless it can be demonstrated that the other source is of greater accuracy and precision. The following is suggested:

1. No data layer is completely accurate, and thus it is more important to designate the benchmark data layer (tax parcels), and stick with it. As parcel data are updated they tend to become more accurate and precise as the problems are steadily rectified year after year.
2. If the Town has GIS data which pre-dates tax parcel data, then the sources of these data should be evaluated. In all likelihood the parcel data generated today will be of greater accuracy (closest to the actual location) and greater precision (less variable). Thus inserting preexisting data into tax parcel automation will in all likelihood reduce the parcel data's overall accuracy and introduce "noise" into them.
3. It does not make sense to make a potentially more accurate line match a less accurate one just because the less accurate one already exists. Tax parcels are too important a data layer. Plan on redoing the old data layer in the future.

Therefore, if several sources of existing GIS data are to be used for constructing a parcel data layer, assess the accuracy and precision of each source beforehand. Compare these to the level of accuracy and precision that will result from the automation of the linework that must be made from scratch. Then, considering time and budget constraints, select the most accurate and precise sources for use.

Appendix A: REQUEST FOR PROPOSALS (TEMPLATE)

INVITATION TO BID
for
Property Mapping

Municipality of **XXXXXX**, Vermont

Note: everything in this TEMPLATE is suggested and can be edited/changed for each town's use. VCGI highly recommends that text that appears black be retained and that text in **RED** be customized for each town's use.

This is a Sealed Bid Response

RFP Issuance Date: **DATE**

RFP Questions Due by: **DATE/TIME**

Proposal Due Date: **DATE?TIME**

One (1) original version (clearly labeled as, "ORIGINAL"), and two (2) copies are required for the submission and must be received by in printed form and delivered to:

RFP Contact Person: **NAME/ADDRESS/CONTACT INFO**,

All bidders are hereby notified that sealed bids must be at the address above by the bid due date and time. Bidders are cautioned that it is their responsibility to originate the sending of bids in sufficient time to ensure receipt by on or before the bid due date. Hand carried bids shall be

delivered to a representative of the town of ?????? on or before the bid due date. Bids not in possession of the Municipality by the due date and time will not be considered.

FAXED BIDS: FAXED bids will NOT be accepted.

ELECTRONIC BIDS: ELECTRONIC Bids will NOT be accepted.

Overview

The Municipality of ?????? (the Municipality) is seeking bids for the property mapping of all parcels within the Municipality. Enclosed find proposed "Property Mapping Specifications" upon which all bids must be based. Bid proposals must be received at the municipal office on or before (Example: April 25 or May 2, 2014 at 4:00 PM)

The Municipality will review all proposals on the basis of execution methodology (plan of performance), firm qualifications, facilities, personnel, and other factors, and will choose the firm which the Municipality believes will provide the best job for the best value. The chosen firm may or may not be the low bidder and the Municipality reserves the right to accept or reject any proposal at its sole discretion.

Prior to the submission of a bid proposal, representatives from each firm must visit the Municipality and review the existing Municipality records sufficiently to ascertain the status of the Municipality records to be used and to understand the magnitude of the job being bid. Upon said visit, the Municipality shall assume that each firm clearly understands the problems, inconsistencies, and overall conditions associated with the Municipality's land records, maps, etc., and that the bid proposal will take these problems into consideration when submitting a price to do a complete, accurate, and thorough job of property tax mapping for the Municipality.

Proposal Submission Procedures and Requirements

Requirements - each bid proposal must contain a written detailed explanation of:

1. The methods the firm intends to utilize (plan of performance) in deed examinations, plotting, etc. to address the specifications as set forth by the Municipality in the **Property Mapping Specifications** below.
2. A timeline for executing the project's phases including proposed start and completion dates.
3. A schedule for the delivery of the identified products and deliverables.
4. A proposed payment schedule tied to the completion of work components and/or the delivery of products. The Town requires a hold back of 10% pending the Town's acceptance of the final products and deliverables.
5. The bid proposal shall break out the costs for the following items:

- a. Creation of digital Parcel Data (including improvement to result in match to grand list as specified in Property Mapping Specifications)
 - b. Creation of paper Tax Map and copies
6. Bid proposal shall also include a **total** for all costs for work being proposed.
 7. The bid proposal may also contain as an addendum individual cost increases or decreases for any options the contractor wishes to offer such as online services or desktop software, as well as a brief written description explaining work which would be done and the product which would be delivered for each option.
 8. Only firm, fixed price proposals will be considered
 9. Proposed costs for labor, materials, services and deliverables should be all-inclusive
 10. A statement of the qualifications and experience of the bidder including a list of 3 municipal clients with contact information in New England and the nature of the mapping projects completed for those clients within the last five (5) years.
 11. A list of employees with brief resumes for those expected to work on this project.
 12. A brief description of the bidder's production facilities and equipment.
 13. The bidder's most recent financial statement, or if none is available, such other information relating to the financial condition of the bidder as will enable the Town to determine the bidder's financial ability to complete the Tax Mapping Project.

Submission Procedures:

Format

An original and two (2) copies of the technical proposal, and an original and two (2) copies of the separate cost proposal must be received no later than **DATE and TIME** . Responses should be addressed as follows (mail or express delivery):

ADDRESS

Proposals may be either mailed or hand delivered; proposals transmitted by FAX machine or other electronic means will not be accepted. If the proposal is sent by mail the applicant will be responsible for actual delivery to the proper office before the deadline. Any proposals received after the deadline will be returned unopened.

All quotation materials submitted will automatically become the property of **Townname**, which reserves the right in its sole discretion to use without limitation any and all information, concepts, and data contained therein. The content of all proposals will be held confidential until an award is made.

Packaging

Each quotation must be sealed to provide confidentiality of the information before the submission date and time. Technical and cost proposals shall be **separately bound and sealed**. The Municipality will not be responsible for premature opening of proposals not properly labeled. Proposals and presentations should be prepared simply and economically, and give a straightforward and concise description of the Respondent's capabilities to satisfy the requirements of the RFP. Special bindings, colored displays, etc., are not necessary. Emphasis should be placed on completeness and clarity of content.

Requests for More Information

Any Bidder requiring clarification of any section of this proposal or wishing to comment or take exception to any requirements or other portion of the RFP must submit specific questions in writing no later than **Deadline for Questions (one to two weeks before submission deadline)**. Questions may be e-mailed to **EMAIL ADDRESS**. Any objection to the RFP, or to any provision of the RFP, that is not raised in writing on or before the last day of the question period is waived. At the close of the question period, a copy of all questions or comments and responses will be posted at **WEBSITE ADDRESS**. The interested Bidder is advised to check the website for responses to questions at any time during the period the RFP is open.

Duly Authorized Signature

The quotation must contain as the first element of the proposal, a cover letter with the signature of a duly authorized officer or agent of the Respondent's company empowered with the right to bind the Respondent. The Respondent shall be fully responsible for all quotation development and submission costs. The Municipality assumes no contractual obligation as a result of the issuance of this RFP, the preparation or submission of a quotation by a Respondent, the evaluation of an accepted quotation, or the selection of finalists.

Proposals shall be binding upon the Respondent for sixty (60) calendar days from the quotation due date. A Respondent may withdraw or modify his/her quotation any time before the due date by a written request, signed in the same manner and by the same person who signed the quotation.

Provisions of this RFP and the contents of the successful response are considered available for inclusion in final contractual obligations. The Municipality retains the option of canceling the award if the successful Respondent fails to accept such obligations.

Price Proposals

Unless Respondents specifically take exception, prices quoted for work to be performed will be considered firm. In case of error in the extension of prices in the quotation, the unit prices shall govern.

Rights Reserved to the Municipality

The Municipality reserves the right to:

1. Amend the RFP as necessary and provide revisions to all prospective proposers.
2. Waive or modify minor irregularities in proposals received, after prior notification to the proposer.
3. Reject any proposal which is incomplete, does not demonstrate the proposer's ability to provide the required services, or which is not responsive to this RFP.
4. Accept the proposal that is, in the sole judgment of the Municipality most advantageous to the Municipality, even though it may not be the lowest priced proposal.
5. Negotiate with any Respondent after proposals are opened, if such action is deemed in the best interest of the Municipality.
6. Negotiate a contract with another qualified proposer in the event that a contract is not successfully and expeditiously executed by the proposer initially selected for contract award.
7. Reject any or all proposals received in response to this RFP.

Terms and Conditions for Proposals

1. Incurred Costs - **TOWNNAME** is not liable for any costs incurred by proposers in preparing their proposals, or any costs of contractors' participation in any pre-contract award activity.
2. Acceptance of Conditions- Submission of a proposal indicates full acceptance by the Respondent of the conditions contained in the RFP and its attachments, unless clearly and specifically noted in the submittal.
3. Notification of Award - After evaluation and selection of the successful proposer(s), all proposers will be notified in writing of the Municipality's decision. The names of the selected proposer(s) will be made available to the public. No press releases pertaining to this project shall be issued without prior written approval by the Municipality.
4. Complete Services/Products - The winning Respondent shall be required to (a) furnish all tools, equipment, supplies, supervision, transportation, and other accessories, services, and facilities; (b) furnish all materials, supplies, and equipment specified and required to be incorporated in and form a permanent part of the completed work; (c) provide and perform all necessary labor; and (d) execute and complete all specified work with due diligence, in accordance with good technical practice and the requirements, stipulations, provisions, and conditions of this RFP and the resultant contract.

Appendix B: SAMPLE STATEMENT FOR PROPERTY MAPPING SPECIFICATIONS

Please **NOTE** that this appendix includes a number of recommended best practices and sample specifications (indicated by red text) that municipalities are encouraged to review and revise based on their needs. Consult the Vermont GIS Parcel Data Standard for required specifications.

The Municipality of **TOWNNAME** comprised of **NUMBER** acres of land, divided into **NUMBER** parcels shall be mapped as follows.

SCOPE OF SERVICES

Contractor will prepare and furnish to Municipality property maps of the entire municipality as well as associated GIS data and reports identified below. The property maps will be current as of **GRAND LIST DATE**.

TIME FOR PERFORMANCE

Work shall commence on or about **DATE** and shall be completed on or before **DATE**, unless extended by mutual written agreement of the parties.

OWNERSHIP OF MAPS, DIGITAL DATA AND RELATED DOCUMENTS

The original property maps, the digital data, and all documents and materials from which they were produced, or which established the accuracy thereof, including, but not limited to manuscripts, shall be delivered to and become the property of the Municipality. The Contractor may retain copies thereof for its files for future reference, but in no event shall copies be sold to third parties except upon the express written consent of the Municipality.

RIGHT OF INSPECTION

The Municipality, through its Board of Listers, shall, at their discretion, make periodic inspections of the work accomplished by the Contractor and the Contractor shall make available all maps, documents, manuscripts and related material at all reasonable times and places.

PAYMENT VOUCHERS

All vouchers requesting payment, along with monthly progress reports, in accordance with the Payment Schedule, shall be presented to and approved by the listers/assessor before payment shall be required by Municipality.

INSURANCE

Contractor agrees that it shall, at its sole expense, procure and maintain workers compensation and general liability insurance in an amount of not less than ONE MILLION DOLLARS (\$1,000,000.00), and shall, upon request, deliver to the Municipality certificates evidencing said insurance.

AVAILABILITY OF MUNICIPALITY'S RECORDS AND DATA

The Municipality will permit the Contractor to use, free of charge, in the performance of the work under this contract, the current and all available past Grand List books, all other applicable data from the Board of Listers and all deeds and surveys presently of record. All said materials shall be available to the Contractor during normal business hours at the respective offices where they are usually kept.

Town Office Hours of Operation and any other alternative contact info for records research

NON-ASSIGNMENT

The Contractor agrees not to transfer, assign, encumber, sell or otherwise dispose of its rights under this Agreement.

EXISTING CONDITIONS

1. Characteristics of the Current Tax Assessor Maps
2. Characteristics of the Tax Assessor Parcel Listing Database
3. Characteristics of Current Geographic Information System (GIS)

DELIVERABLES

The contractor shall deliver to the town the following materials and services as specified in these technical specifications and/or other contract

documents. These materials become the property of the town as soon as they have been prepared.

1. Identification and resolution of Parcel Identification Numbering (SPAN) inconsistencies between the parcel data and the Grand List in Microsoft Excel format, with percentage of remaining issues identified.
2. Master List of “Discrepancies/Problem Parcels List” and efforts taken to resolve in Microsoft Excel format, including those parcels with areas having a calculated vs. listed percent of divergence where the tolerance is exceeded. **Specify tolerance**
3. Seamless townwide parcel dataset with metadata in compliance with the GIS parcel data requirements listed or referred to below.
4. **Two (2) sets of prints made from the property map overlays, one of which shall be composite print (orthophoto overprinted with property lines). Town requires two sets of both the parcel maps and overprinted orthophotos. These hard copies will be at a scale of 1:5000. The area of the image on each sheet shall be approximately 31 inches by 31 inches and have a margin of about 2-1/2 inches for an overall size of approximately 36 inches by 36 inches.**
5. **Index map to scale of 1:20,000 or with a maximum size of 36" x 36" showing all map sheets with town and roads**
6. Public viewing advertisement, support personnel, and correction of documented errors found as a result of the viewing
7. All materials (e.g., surveys), purchased by contractor, used in deed research and/or tax map preparation
8. All source materials and information located during contract filed by reference number (on appropriate parcel cards/data file)
9. All digital/soft copy files shall be delivered on CD-ROM, DVD, or via digital file transfer.

TECHNICAL SPECIFICATIONS

1. Tax Map Printouts

Cartographic Standards for Printed Maps:

Printed tax maps shall adhere to these specifications:

1. The property tax maps shall contain standard margin data such as scale and a legend/key to any symbols, colorations or markings used. The Corner Tics must be clearly and precisely placed and labeled using Vermont State Plane Coordinates (meters NAD83). Additionally, the boundary of the maps shall have tic marks every 1000 meters. No internal tics are required.
2. Consistent and generally accepted standard point/line symbology shall be used on all property maps.
3. Show all land parcel property lines. Common ownership visually joined with a symbol or repetitive printing of the parcel number.
4. Show all Parcel IDs or Lot numbers for each parcel (SPAN will not be shown on the printed maps, but will be included as an attribute in the GIS database) using Labels (or feature linked annotation), sized appropriately for the map size and scale.

5. Show all parcel acreage for all parcels, using Labels (or feature linked annotation), sized appropriately for the map size and scale. Acreage shall be based on the listed acreage information in the Grand List. The calculated area (from GIS file) will be used for those that do not have acreage information in the Grand List.
6. Show public street, road and highway rights-of-way, and private roads (excluding driveways). Town and state highway numbers and road names are to be shown. Contractors should use VTrans' official road centerline data (GIS data) for all public right-of-ways, and E911 road centerline data for all private roads (GIS data). These can be downloaded from VCGI's website.
7. Show public utility rights-of-way with their designations, if mapped.
8. Surface water features should be based on the Vermont Hydrography Dataset available from the Vermont Center of Geographic Information. Where surface water feature dissects a parcel, its multiple portions will be visually joined with a symbol or repetitive printing of the parcel number. Rivers, streams, ponds and swamps along with their names shall be marked.
9. "Official" names of all wholly tax exempt property must also be shown on the map.
10. Include a North Arrow
11. Show adjacent map sheet numbers
12. Show lot numbers of recorded sub-divisions, using Labels (or feature linked annotation), sized appropriately for the map size and scale.

Disclaimer:

Each map will contain the following disclaimer, printed with a character height of 0.1 inches or higher:

"This map is for assessment and planning purposes only. It is not to be used for description, conveyance, or determination of legal title."

Printing:

While every effort should be made to try and place an entire parcel on one map sheet, in the situation(s) where a given parcel falls on more than one sheet: the parcel and its match lines shall be clearly labeled on each map sheet, together with notes as to where the remainder of the parcel appears. The parcel number and parcel area shall appear on each map sheet containing the parcel.

2. GIS Parcel Data Creation or Update Specifications

GIS Parcel Data Standard Requirements

GIS parcel data and metadata shall meet specifications found in Level 1 of the current VT GIS Parcel Data Standard published at the VCGI web site: vcgi.vermont.gov.

GIS Parcel Data Development

Consultant/Vendor is required to create new parcel geometry for the Town of X using town clerk maps and use assessor maps to complement areas where there are no surveys on file. Town X will enter the appropriate town clerk maps source identifier where applicable into existing Town parcel polygons. The VT DOT Right-of-way and Railway valuation maps must be entered with coordinate geometry (COGO) and fit to GPS coordinates (provided by Town X) or existing reliable parcel corners. Town X will also provide the town boundary outline. Parcels that do not align with this town boundary should be flagged for review and research with the Town to resolve. Town will make available scanned copies of town clerk maps and indices for the creation of the parcel data. Digital copies of the VT DOT Right-of-Way and Railroad Valuation maps and indices will also be provided.

Reconciliation of GIS and Grand List data

Consultant/Vendor is required to follow State of VT Quality Control Standards specified in the VT GIS Parcel Data Standard. Once the parcel data is standardized and “clean”, Consultant/Vendor will conduct quality control steps to ensure the mismatches are being corrected. The mismatches include records in the Grand List database that do not have a corresponding record in the GIS parcel data, conversely records in the GIS parcel data that do not have a corresponding record in the Grand List data and duplicates records in both CAMA and GIS. In addition, Consultant/Vendor Compare lot areas as listed in the Grand List database and GIS-derived areas; classify parcels by percentage differences (to enable parcels with significant differences to be further researched by Town). At the end of the update process, Vendor/Consultant will present a semi-final data quality audit report to the Town.

Once the Vendor/Consultant has submitted the semi-final data quality audit report to the Town, it will be the Town’s responsibility to review the audit report and provide feedback and information to resolve the mismatches to Vendor/Consultant. It is anticipated that some of the mismatches will require too much effort to resolve in a short turnaround. With that said the mismatches that require too much effort will be flagged as such and will be targeted for future research. Ideally the final mismatch list will contain a very small percentage of the total number of parcels, and will at a minimum meet the requirements of the VT GIS Parcel Data Standard for the match rate. At this point, Vendor/Consultant will finalize any remaining corrections based on information provided by Town.

Pilot Project

Verification of the contractor's approach to the work will be required. This pilot is intended to test all production methodologies and establish successful procedures to follow throughout the project timeline. The pilot will cover an area of at least four (4) contiguous map sheets.

1. An area of town will be discussed and approved by the town.
2. Within 2 1/2 months of contract approval, the contractor must deliver four (4) paper map examples representing the four (4) contiguous maps requested.
3. A single digital file representing the above four (4) map examples will also be provided. All data layers requested in the GIS Data Specifications shall be included.

Appendix C: ITEMS TO BE CONSIDERED IN EVALUATING MAPPING PROFESSIONALS

It is recommended that municipalities consult with other towns and/or their Regional Planning Commission for help when reviewing proposals and seeking feedback about mapping professionals' past work.

1. Responsiveness to the specifications and the contractor's proposed plan of performance. The plan of performance should include a schedule for accomplishing the work, including the time required for each phase.
2. Experience. Request a client list and contact them. Review one or two of the most recent projects, by examining the work and discussing the client's satisfaction with the mapping contractor's work.
3. Equipment and production facilities. Request a written statement of how maps are prepared. Ask for a listing and description of equipment to be used on the project.
4. Personnel. Ask for a listing of full-time employees of the firm available to work on the specified project and brief resumes of key mapping personnel. The caliber of workforce can be an important factor in a firm's ability to produce acceptable maps.
5. Support programs. Technical assistance and support for using and creating the maps and the numbering system employed on the maps should be provided.
6. Cost. Cost should be measured in relation to the service to be provided.

Appendix D: PROPERTY MAP CONTRACT

This document can be used as template or checklist to ensure the agreement includes key elements. It is recommended that the contract include the same scope of work and reference to VT GS Parcel Data Standard that the RFP includes (with any negotiated changes).

This Agreement made this _____ day of MONTH, YEAR by and between the Municipality of _____, a municipal corporation located in the County of _____ and State of Vermont hereinafter "Municipality", and _____, a business organized and existing under and by virtue of the laws of the State of _____ and having its principal place of business in _____ in the County of _____ and State of _____ hereinafter "Contractor".

WITNESSETH:

That for and in consideration of the payments and agreements hereinafter mentioned:

1. **SCOPE OF SERVICES** In accordance with the contract documents, as hereinafter defined, Contractor will prepare and furnish to Municipality property maps of the entire municipality to be completed on or before _____. The property maps will be accurate as of _____.

2. **CONSIDERATION** Municipality will pay Contractor the sum of _____ Dollars in accordance with the payment schedule attached hereto as Exhibit A.

3. **CONTRACT DOCUMENTS DEFINED** The term "contract documents" means and includes the following:

- A. Advertisement for bids;
- B. Specifications;
- C. Contractors bid;
- D. This Property Map Agreement;
- E. Notice of award;
- F. Schedule of Payments;
- G. Any change orders.

4. **TIME FOR PERFORMANCE** Work shall commence on or about _____, and shall be completed on or before _____, unless extended by mutual agreement of the parties hereto in writing. An established completion schedule is important.

5. DELIVERABLES

- A. Documentation of source materials and information located during contract referenced to each parcel, as specified in the contract.
- B. All digital parcel map layers in GIS data format - please refer to the VT GIS Parcel Data Standard for requirements related to GIS data and metadata - on the media specified (DVD, hard drive, etc.)
- C. Hard copy parcel maps; number and size shall be specified in the contract and shall include an Index Map showing all map sheets with town boundary and roads.
- D. All reports called for in these technical specifications, in hard copy and/or digital format, as specified in the contract.
- E. Additional digital files relevant to the project, as specified in the contract

6. **OWNERSHIP OF MAPS, DIGITAL DATA AND RELATED DOCUMENTS** The original property maps, the digital data, and all documents and materials from which they were produced, or which established the accuracy thereof, including, but not limited to manuscripts, shall be delivered to and become the property of the Municipality. The Contractor may retain copies thereof for its files for future reference, but in no event shall copies be sold to third parties except upon the express written consent of the Municipality.

7. **RIGHT OF INSPECTION** The Municipality, through its Board of Listers, shall, at their discretion, make periodic inspections of the work accomplished by the Contractor and the Contractor shall make available all maps, documents, manuscripts and related material at all reasonable times and places.

8. **PAYMENT VOUCHERS** All vouchers requesting payment, along with monthly progress reports, in accordance with the Payment Schedule shall be presented to and approved by the listers before payment shall be required by Municipality.

9. **INSURANCE** Contractor agrees that it shall, at its sole expense, procure and maintain workers compensation and general liability insurance in an amount of not less than ONE MILLION DOLLARS (\$1,000,000.00), and shall upon request, deliver to the Municipality certificates evidencing said insurance.

10. **AVAILABILITY OF MUNICIPALITY'S RECORDS AND DATA** The Municipality will permit the Contractor to use, free of charge, in the performance of the work under this contract, the current and all available past Grand List books, all other applicable data from the Board of Listers and all deeds and surveys presently of record. All said materials shall be available to the Contractor during normal business hours at the respective offices where they are usually kept.

11. **NON-ASSIGNMENT** The Contractor agrees not to transfer, assign, encumber, sell or otherwise dispose of its rights under this Agreement.

12. **NOTICES** Any and all notices or other communications required or permitted by this Agreement or by law to be served or given to either the Municipality or the Contractor by the other party shall be in writing and shall be deemed duly served and given personally delivered to the party to whom it is directed, or in lieu of such personal service when deposited with the United States Postal Service by certified mail, return receipt requested, postage prepaid, addressed to the parties at the following addresses:

TO MUNICIPALITY: _____

W/ Copy to: _____

TO CONTRACTOR: _____

Either party may change its address for the purposes of this paragraph by given written notice of such change to the other party in the manner provided for in this paragraph.

13. ENTIRE AGREEMENT The contract documents contain the entire Agreement between the Municipality and the Contractor and any other agreements or representations between the parties hereto not expressly set forth in said contract documents are null and void and of no force and effect.

IN WITNESS WHEREOF this Agreement is entered into as of the date first above written.

MUNICIPALITY: BY _____

CONTRACTOR: BY _____

Appendix E: SCHEDULE OF PAYMENTS

Not later than the ___th day of each month during the term of this Agreement, the Contractor shall submit to the Municipality a partial payment voucher filled out and signed by the Contractor covering the work performed during the period covered by the voucher and supported by the Monthly Progress Report (see Exhibit F) and such data as the Municipality may reasonably require. Within 15 days of receipt of said voucher, the Municipality shall make payment to the Contractor or return the voucher to the Contractor indicating in writing its reasons for refusing to make payment. In the latter case, the Contractor may make the necessary corrections and resubmit the voucher, in which case payment shall be made within 15 days of said resubmittal.

Final payment voucher shall be no less than 10% of the total contract amount, and shall not be paid until the Municipality has had the opportunity to review and accept the completed product and deliverables. In no case shall that be more than 45 days from receipt of the voucher.

If the Municipality, while reviewing the completed contract work ascertains that it has not been performed in accordance with the contract documents, it shall return all of said work to the Contractor for revision as per the contract documents and the Municipality shall withhold further payments until the Contractor satisfactorily completes the terms of the contract.

If, after forty-five (45) days commencing upon receipt of the final contract work, the Contractor has not received formal acceptance or rejection in writing from the Municipality, the Contractor shall be deemed to have satisfactorily completed the contract and the Contractor shall be due the final payment of the contract.

Appendix F: CONTRACTOR'S MONTHLY PROJECT REPORT

MUNICIPALITY OF _____ PROPERTY MAPPING PROJECT

Name of Contractor: _____

Month/Year of Report: _____

1. List work features currently underway or completed (i.e., map compilation, drafting, digitizing, plotting, data base, etc.), the date work on each feature began, and the percentage of completion of each feature as of the date of this report:

DATE BEGUN	% COMPLETED	WORK FEATURE
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2. List those work features expected to be started in the coming month.

3. Describe briefly all problem areas presently being encountered or anticipated.

Signature

Title