



STATEWIDE DIGITAL PARCEL DATA REPORT

Report to the Vermont General Assembly on
recommendations to ensure maintenance of
Statewide Property Parcel Data

Report prepared by the Vermont Center for
Geographic Information on behalf of the
Property Parcel Data Advisory Board

December 19, 2018



ACKNOWLEDGEMENTS

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Figure 1. Example of parcel data combined with building footprints, hydrography, and roadways along the Winooski River.

EXECUTIVE SUMMARY

Parcel data in Vermont provides an accounting of over \$93 billion of assessed property value and lets us see who owns what and where for a state nearly 10,000 square miles in size. Of the 1,039 datasets maintained in the State of Vermont Open Geodata Portal, parcel data is – by a significant margin – the most frequently requested data.

In 2016, recognizing the significant value of statewide parcel data, the General Assembly passed Act 158, created the Statewide Property Parcel Mapping Program, to ‘develop, maintain, and make available property parcel data available to State agencies and departments, regional planning commissions, municipalities, and the public.’ In establishing the program, the General Assembly created the Property Parcel Data Advisory Board to monitor and make recommendations to improve the program. This report is comprised of the Board’s recommendations to improve the program, with a focus on sustaining long-term parcel maintenance.

The recommendations in this report build on

the work of the Advisory Board’s predecessor, the ‘Statewide Parcel Data Workgroup’ created in 2013, as well as the Vermont Statewide Digital Parcel Lifecycle and Maintenance Plan commissioned by the Agency of Transportation in 2015. Development of the recommendations included significant outreach and feedback from stakeholders outside of state government, including: workshops held in every county, 199 survey responses, municipal official focus groups, and the formation of a Technical Advisory Committee. Participating stakeholders included: municipal clerks, listers, assessors, zoning administrators, regional planning commissioners, GIS professionals, consulting foresters, educators, land surveyors, engineers, and real estate professionals.

The Parcel Data Advisory Board considered a variety of suggestions to improve the parcel program and evaluated options relative to their cost, municipal burden, effect on local control, flexibility, risk, resources required, and effectiveness.

SUMMARY OF RECOMMENDATIONS

1. Create a single statewide survey library for digital copies of survey plats

- a. Require surveyors to submit digital copies of surveys prepared for recording in accordance with 27 V.S.A. § 1401-1404 to the library
- b. Historical and as-built land surveys may be added to the library by surveyors over time, but are not required

2. Require the recording of plats for changes in property lines and subdivisions

- a. Require survey plats of new or modified lines in subdivisions and boundary line adjustments

3. Integrate parcel data with property information management system software

- a. Link parcel data and allow for its updating by municipal officials within property information management system software
- b. Evaluate possibility of requiring updates to town parcel information to be submitted and/or validated with the annual submittal of their grand list

4. Implement a maintenance plan with shared state and local responsibilities

- a. Create a streamlined form and process for parcel data submission
- b. Consider designating a parcel coordinator for the state and each Regional Planning Commission
- c. Evaluate incentives for ongoing municipal maintenance of data that meets the parcel data standard, such as the modification of reappraisal payments
- d. Evolve contents of parcel data standard with incorporation of enhancements
- e. Maintain relationships with professionals associated with parcel data creation and upkeep

5. Transition Parcel Program to the Vermont Center for Geographic Information

- a. Amend 19 V.S.A. § 44 and/or 10 V.S.A. § 123 to transfer oversight of long-term parcel maintenance from VTrans to VCGI in July 2020

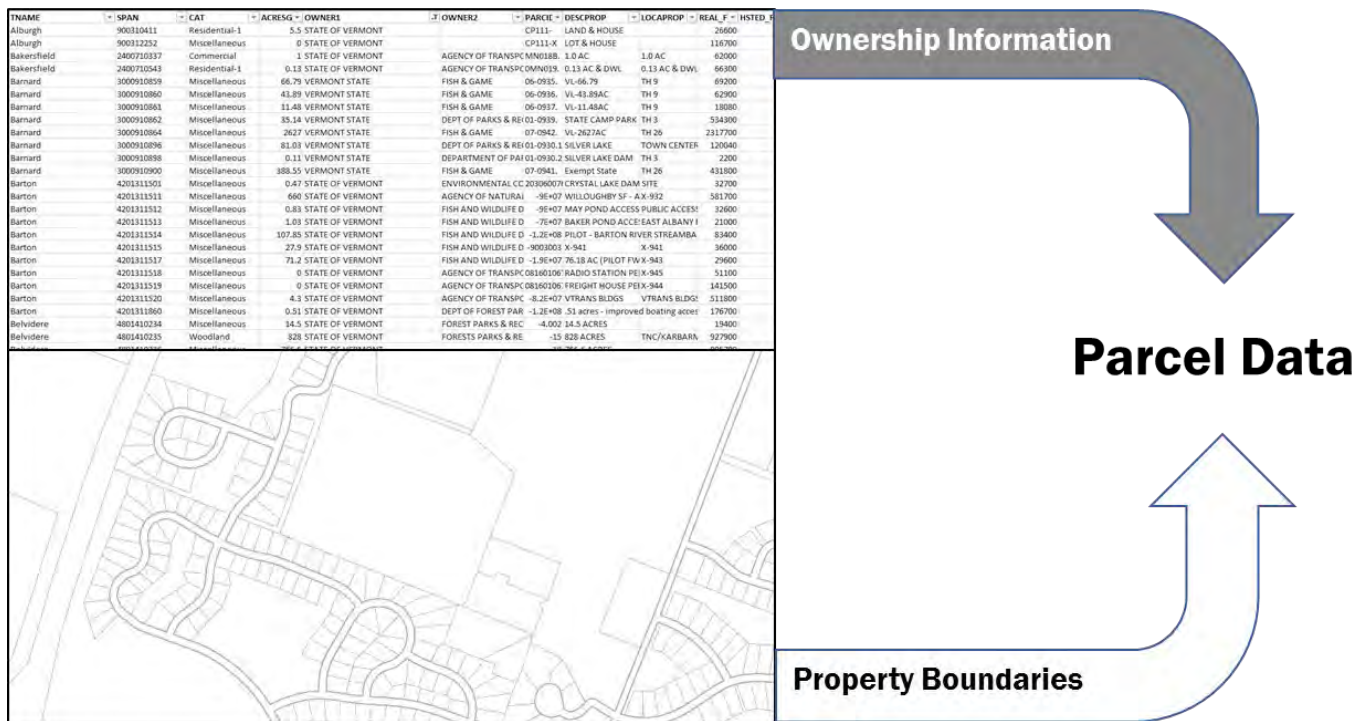


Figure 2. Parcel data is a combination of property ownership information, such as that contained within the Grand List, and mappable spatial boundary information.

INTRODUCTION

WHAT ARE PARCEL DATA?

Parcel data are the digital, geographically-referenced data used to represent parcel boundaries, un-landed dwellings, and associated attribute information on municipal tax maps. The definition of ‘parcel’ in 32 V.S.A. § 4152 is, “all contiguous land in the same ownership, together with all improvements thereon.”

Parcel data are among the most valuable datasets managed by governments across the country. The Federal Geographic Data Committee has identified parcel data as one of the seven framework layers that make up the National Spatial Data Infrastructure (NSDI). The NSDI was enacted into law to ‘ensure that geospatial data from multiple sources (including the covered agencies, State, local, and tribal governments, the private sector, and institutions of higher education) is available and easily integrated to enhance the understanding of the physical and cultural world.’¹ Framework data are those most commonly needed across

different disciplines and levels of government – they are the foundation upon which other datasets are built.

Of the 1,039 datasets maintained in the State of Vermont Open Geodata Portal, parcel data is – by a significant margin – the most frequently requested data.

Use cases for parcel data are plentiful across the public and private sector, including: facilitating real property transactions and economic development; identifying areas with suitability for locating businesses or alternative energy facilities; visualizing financially distressed areas as an early warning indicator for policy-makers; estimating the scope of forest fragmentation; informing stormwater management policy, and numerous other use cases.²

1 See the [Geospatial Data Act of 2018 \(H.R. 302, P.L. 115-254\)](#), and [OMB Circular A-16](#).

2 See the [‘Vermont Statewide Digital Parcels Return on Investment \(ROI\) Study,’](#) September 16, 2015.

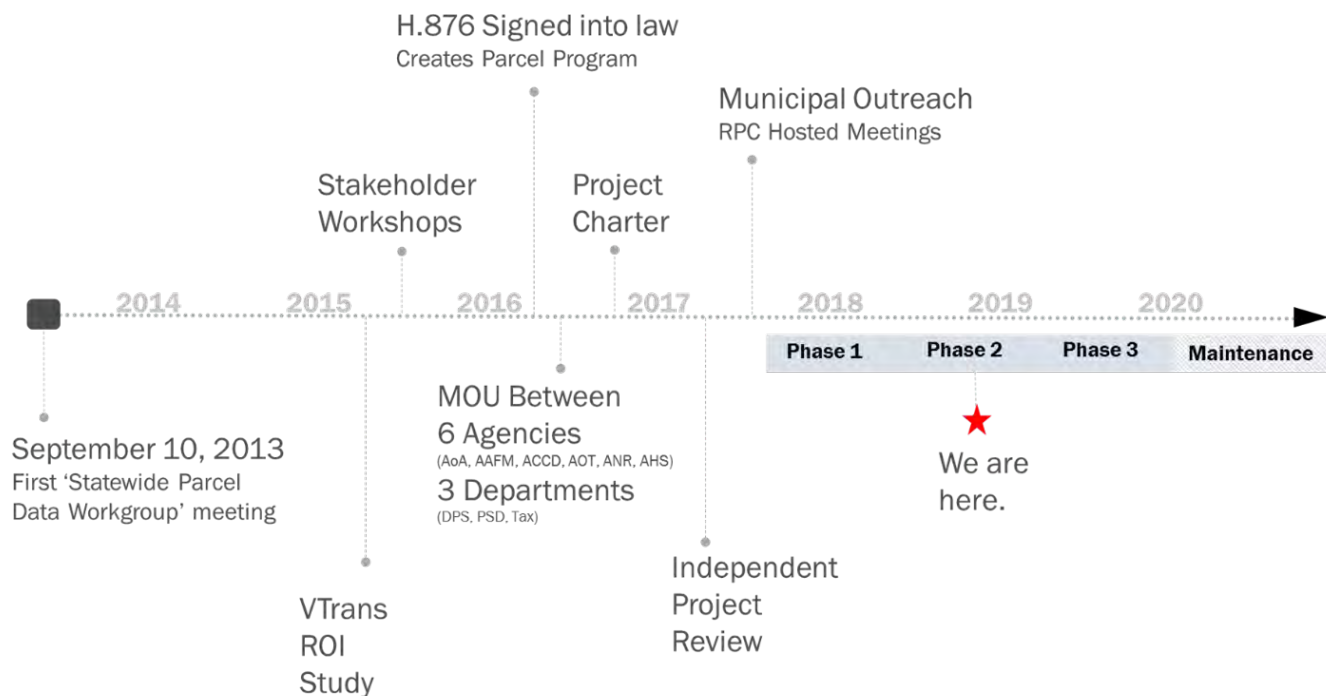


Figure 4. Timeline of the development of the Vermont Statewide Property Parcel Mapping Program.

cooperatively to develop and fund the statewide parcel program. The design and development of the program was developed with assistance of a consultant that had developed programs in other states and involved extensive outreach to municipalities with workshops and focus groups help in every county. The resulting three-year project to develop statewide data began in 2017 and was designed to build on the existing work of many municipalities and their vendors.

CURRENT STATUS OF PARCEL DATA IN VERMONT

Parcel data availability was inconsistent across the state prior to the initiation of the Statewide Parcel Program. While some towns had current data available, other data was over 20 years old and several towns had no electronic – or even paper – data at all available (see Figure 5). In many cases, the local data did not have the information required to allow easy cross referencing to ownership and value data available in the grand list.

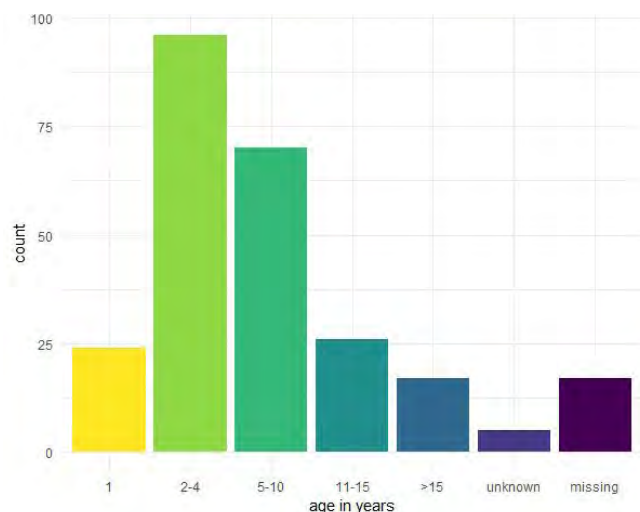
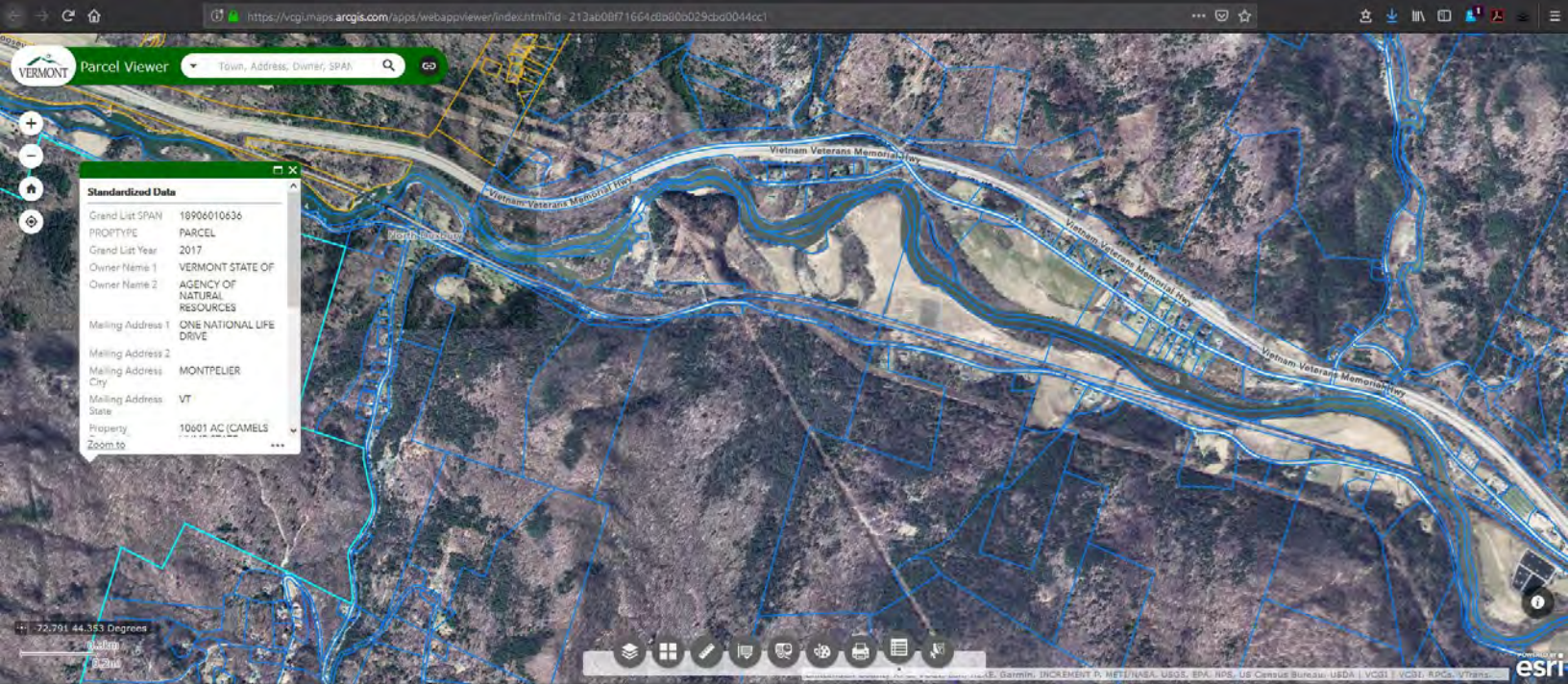


Figure 5. Age of Vermont parcel data at the time of project initiation in 2017, displayed by count of municipalities by respective parcel data age in years.



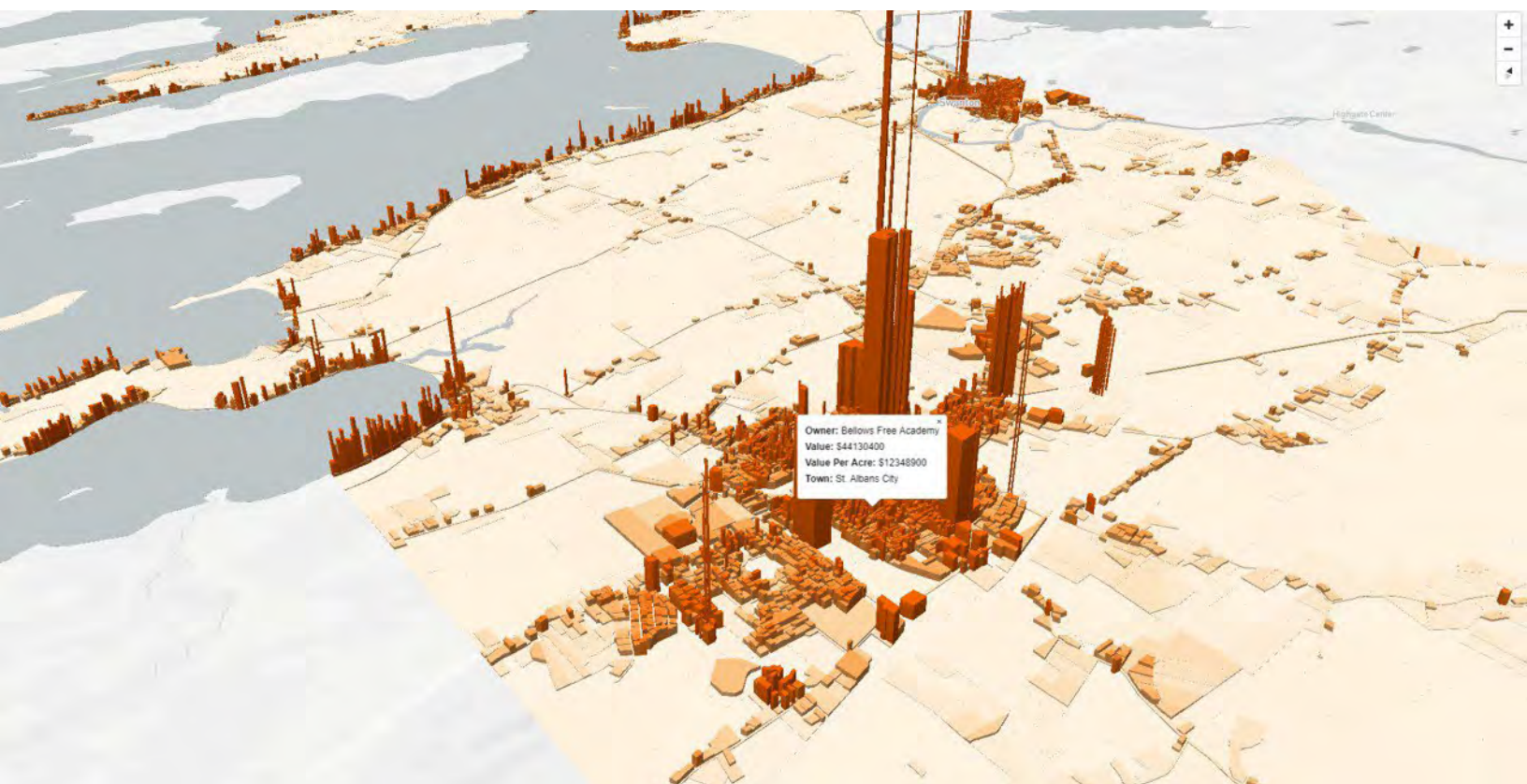
Parcel data status: **Parcel polygons** | Parcels (non-standardized)

Options | Filter by map extent | Refresh

OBJECTID	GIS SPAN	Grand List SPAN	MAPID	Parcel ID	PROPTYPE	GIS Year	Grand List Year	TOWN	SOURCENAME	SOURCETYPE	SOURCEDATE	EDITMETHOD	EDITOR	EDITDATE	MATCHSTAT	EDITNOTE	Owner Name 1	Owner Name 2
510712	189-060-1063	18906010636	300-3504	300-3504	PARCEL	2,017	2017	DUXBURY	TOWN OF DUXBURY, VERMONT TAX PARCEL MAP	SCANNED TAX MAP	20150323	OTHER	VHR	20180208	MATCH	Merged to reflect Tax Map 09	VERMONT STATE OF	AGENCY OF NATURAL RESOURCES

Figure 6. (Above) Screenshot of the Vermont Parcels Viewer, a standalone web mapping application that displays grand-list joined parcel data generated by the program. This application is expected to be released to the public in early 2019.

Figure 7. (Below) Fiscal impact analysis is one use of grand list-joined parcel data. This picture displays a screenshot of the assessed value of individual parcels in St. Albans. Taller extrusions represent higher assessed values on a per-acre per parcel basis.



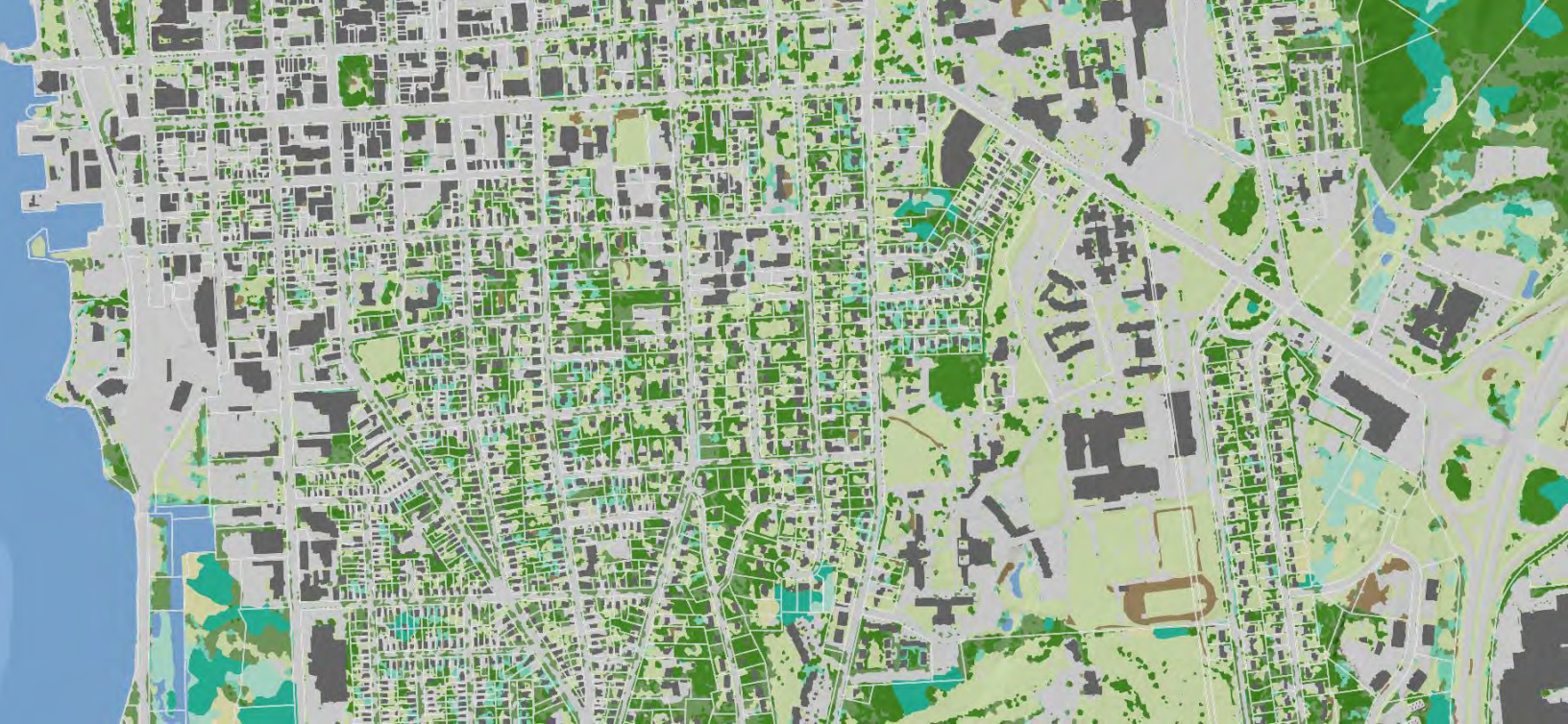


Figure 8. (Above) Parcel data may be combined with other datasets, such as lidar-derived high-resolution land cover. VCGI will make statewide coverage of such high resolution landcover available in 2019.

Figure 9. (Below) Parcel data can also be combined with municipal datasets and used for planning and policy-making. This image depicts a tilted view of Barre City's zoning regulations combined with parcel and building footprint data.

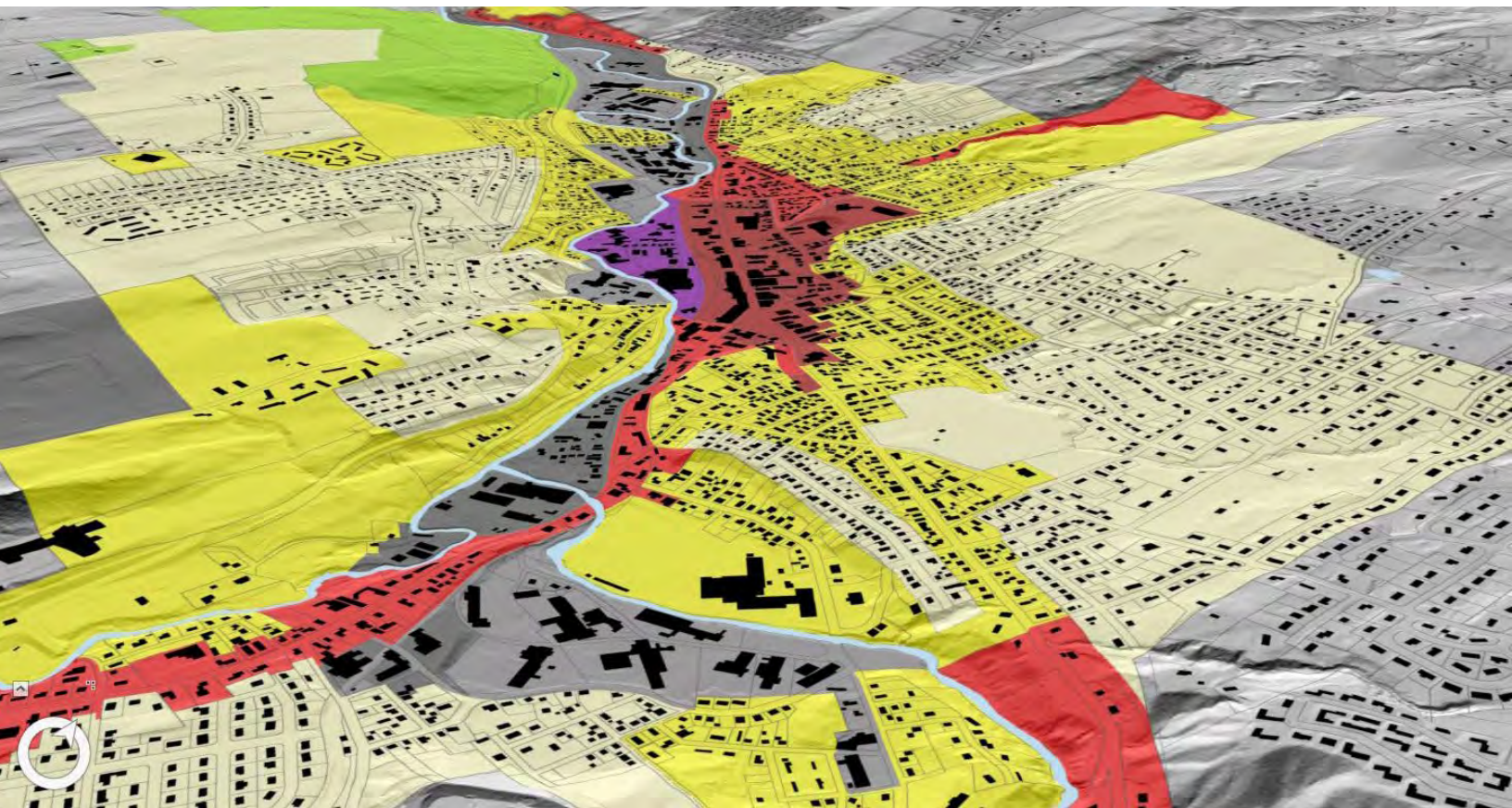




Figure 10. (Above) Parcel data can be used for emergency management. Here a stream corridor is shown with grand list-joined parcel data that makes it easier for rapid identification of property owners and faster preliminary damage assessments. Image courtesy of UVM Spatial Analysis Lab.

Figure 11. (Below) Advanced analysis is possible when standardized parcel data is joined with other information. This image shows the percent of impervious surfaces on a per-parcel basis when combined with high-resolution land cover data. Image courtesy of UVM Spatial Analysis Lab.



Since the initiation of the program, 73 Phase 1 (2017) towns are complete and available in the state's geodata portal, as well as various map viewers (such as the ANR Atlas, and a stand-alone parcel data viewer (<https://tinyurl.com/y9gfcuqf>)). Phase 2 (2018-19) of the program includes 103 municipalities and will be complete in April of 2019, with the remaining 79 Phase 3 (2019) towns to be complete by December 2019.

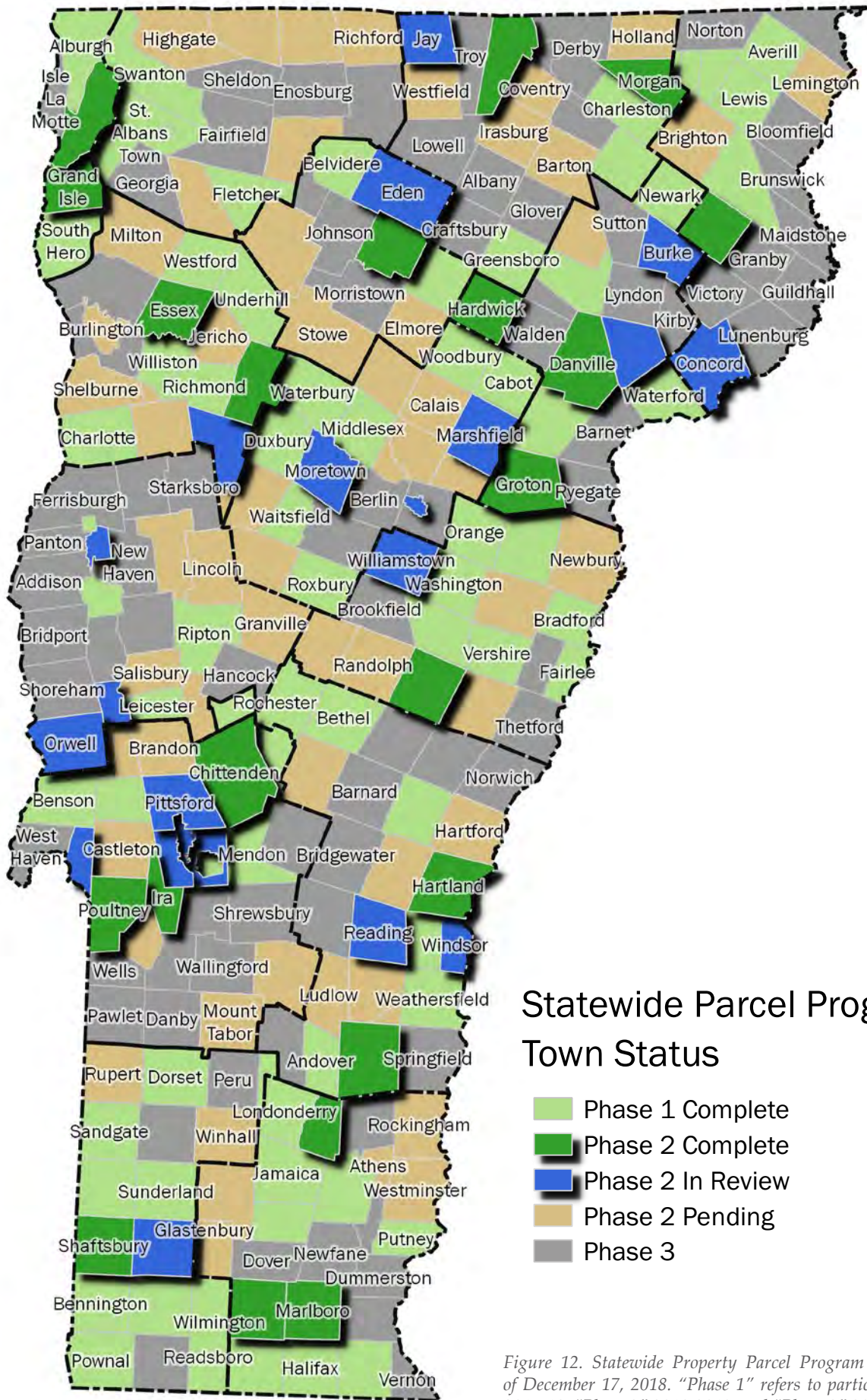
The completed towns which have been joined to the grand list as of December 10, 2018, total 93,000 parcels with a value of \$24.55 billion. This represents approximately 28% of the state's 330,000 parcels (see Figure 12).

It is important to note what the three-year, three-phase program to be completed by December 2019 does not include. The program focuses on making public parcel data more publicly accessible and useful across the state. It specifies the workflow and digital standard for town property records to be matched with the Grand List. It does not include surveying for new linework, verifying the precise spatial accuracy of existing linework, providing access to existing surveys, unifying different town mapping practices (for public rights-of-way and contiguous ownership, for example), reconciliation of mineral rights with at-grade ownership (e.g. two deeds assigned for the same parcel), town boundary discrepancies, or the development or update of paper or online tax maps for municipalities. We expect that some of these items may be improved in the future as a result of the three-year project, but they remain longer-term challenges with the upkeep of standardized parcel data that remains current, reliable, comprehensive, and ultimately, useful.

With that said, year one and two of the parcel project has clarified lessons to be learned for both the project's completion and long-term parcel maintenance thereafter. These involve making improvements and providing consistency with the Grand List format and its accessibility, advancing communication with smaller towns, providing ways to improve the spatial accuracy of parcel data, and providing ways to enable more frequent updates to parcel data for all of Vermont's municipalities. Areas of success have been the state's partnering with mapping vendors to work with towns, sharing knowledge with all parties involved in parcel data creation and upkeep,

creating and documenting standards, providing easy to use tools for the public to interact with parcel data, and having regular communication with vendors as they work with towns.

In summary, parcel data in Vermont has greatly benefitted from the first half of the Statewide Property Parcels Mapping Program. Yet it has also clarified the ways in which parcel data may be maintained in its usefulness once the project has completed the initial joining of all municipalities parcel data with the Grand List.



RECOMMENDATIONS

THE CONTEXT OF PARCEL MAINTENANCE AND UPDATES

Ensuring timely, consistent parcel maintenance in northeastern states such as Vermont can be difficult and complex, especially given the varied nature of land records upkeep. Applied Geographics, Inc. developed the [Vermont Statewide Digital Parcel Lifecycle & Maintenance Plan](#) as part of the [2015 ROI study and report](#) conducted prior to the creation of the Statewide parcel program. The report recommends a path forward that incorporates lessons learned in other states, while accounting for the unique components that make up the parcel “ecosystem” of Vermont.

Specifically, the ROI report recommended means of sustained funding for state parcel upkeep, establishing VCGI as the lead group, promoting the parcel standard, relying on qualified private mapping vendors, integrating parcel data with CAMA software, maintaining quality control, and preparing for ongoing maintenance—of which this document addresses and expands.

It is helpful to clarify the previous process by which Vermont’s parcel data was obtained by the state prior to the parcel program. VCGI acquired parcel data in the past by sending out email solicitations to Regional Planning Commissions (RPCs) for updated parcel data and publishing what was submitted in response, typically on an annual or biannual basis. This process relied on several factors:

- the ability of RPCs to obtain recent parcel data from municipalities and vendors,
- the ability of municipalities to update the data,
- the responsiveness of RPCs to VCGI inquiries, and
- the capacity/frequency of VCGI for updating public statewide parcel data.

Parcel data obtained in this way was not always the most recent product, resulted in uneven coverage across the state, and was often prepared by data

stewards with varying GIS experience.

This past process is not a sustainable approach to the long-term maintenance of parcel data. It requires multiple efforts that, even if taken, do not ensure a reliable, up-to-date parcel dataset for every Vermont municipality. These include:

- towns providing RPC’s with reliable, consistent, and regular parcel information for RPC’s to upkeep their respective towns’ parcel data
- consistent state communication with RPCs (and a potential restructuring of existing data transmission pathways)
- encouraging municipalities to specify in their contracts with vendors that parcel data must meet the state standard and be digitally submitted to them, and
- that a digital copy also be delivered to the Statewide Parcel Program upon completed update for each municipality.

The past process of updating and maintaining parcel data is not recommended.

CONSIDERATIONS OF A SUSTAINABLE AND EFFECTIVE PARCEL MAINTENANCE PROCESS

We evaluated multiple options for long-term parcel maintenance that adheres to the state standard while considering the Vermont parcel mapping context. Maintenance options that have been considered are in many cases cross-compatible and not mutually exclusive. Parcel maintenance options were derived from a combination of those outlined in the 2015 ROI report, experience with administering the parcel project, and lessons from practices in other states. Options were evaluated by the following criteria:

- Cost
- Municipal burden

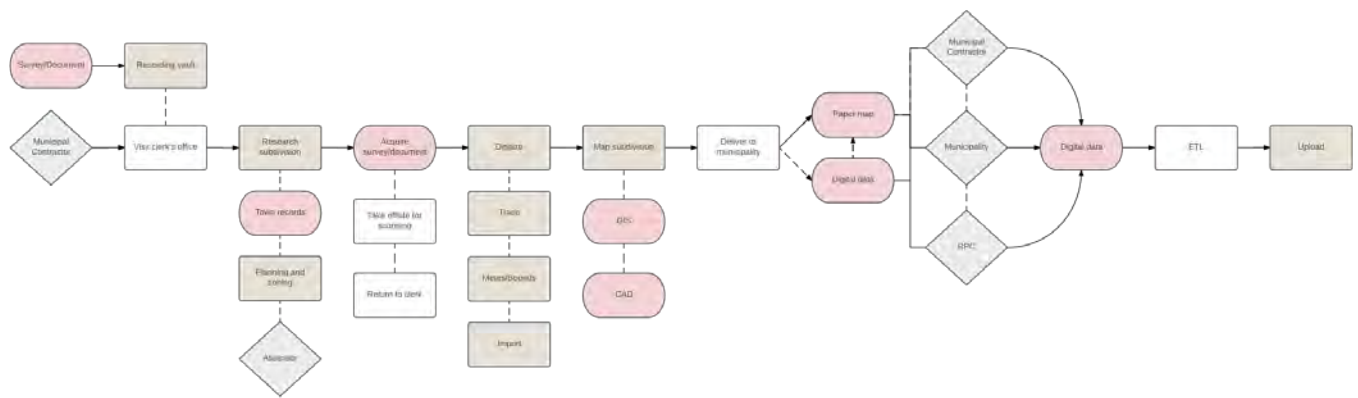


Figure 13. The digital parcel data update process for an individual municipality before the parcel program.

- Effect on local control
- Flexibility
- Risk
- Required resources
- Effectiveness

Evaluations of options were presented to the parcels advisory board in September and October 2018 for review and consideration, with the board's guidance contributing to the recommendations presented in this document.

Maintenance options considered and ultimately recommended were also informed by outreach conducted in the past several years, and in particular in the Fall of 2018 with professional groups that have bearing on the provisioning, storage, use and/or upkeep of parcel data and land records in Vermont. These groups included:

- Vermont State Archives & Records Administration (VSARA)
- Vermont League of Cities and Towns (VLCT)
- Vermont Association of Planning and Development Agencies (VAPDA)

- Members of Vermont Planners Association (VPA)
- Vermont Board of Land Surveyors
- Vermont Realtors Association (VRA)
- Vermont Society of Land Surveyors (VSLS)
- Vermont Assessors and Listers Association (VALA)
- Vermont Municipal Clerks and Treasurers Association (VMCTA)

Input from these groups provided valuable perspectives, ideas, and highlighted the diverse priorities and concerns of different groups. For example, any new point of sale costs are a concern of the Realtors Association, whereas listers and assessors were concerned about different versions of parcel data becoming overly confusing. Other concerns included the specifics of how to manage parcel data associated with surveys that are and are not filed to the land records by town clerks, to considerations of the current fee structure of towns for access to the land records that may be impacted by making parcel data more publicly accessible through web mapping tools.

RECOMMENDATIONS

1. Create a single statewide survey library for digital copies of surveys

- a. Require surveyors to submit digital copies of surveys prepared for recording in accordance with 27 V.S.A. § 1401-1404 to the library
- b. Historical and as-built land surveys may be added to the library by surveyors over time, but are not required

Requiring digital copies of surveys for subdivisions and boundary line adjustments to be submitted to one location overseen by VCGI has been identified by the parcel team, parcel data contractors, and land surveyors as a viable and effective means of simplifying the existing parcel update process. A statewide digital survey library could be created by VCGI to store, transmit, update, and make public these digital survey data. VCGI has worked with members of the Vermont Society of Land Surveyors to develop the legitimacy and mechanics of this repository, and the idea has strong support from stakeholders whose work depends on reliable parcel data.

A centralized digital survey library has the potential to improve the quality and lower the cost of parcel data maintenance, regardless of who is performing the updates. Submitted surveys could be used for performing updates to parcel linework and eliminate the need to scan plats filed in accordance with 27 V.S.A. § 1401, 'Filing of Land Plats.' (Note: it is recommended that surveys recorded in the municipal land records remain the authoritative source.)

In order to limit any added burden to municipal clerks, surveyors should be required to submit digital copies of plats to the survey library, as opposed to having municipalities scan these large documents. Out of 56 licensed surveyors polled, all but one currently generated digital surveys. A digital pdf copy can easily be created during the process of generating a printed 'mylar' required for public record, and mylar creation also serves as a potential time for the surveyor to submit the digital copy to the library.

While most subdivision plats prepared for

recording are submitted to the land records, it is possible that some do not get recorded. A verification process with municipalities could be established to confirm that a submitted survey is a valid document on which to make changes to the parcel data set. Digital copies of recorded subdivision plats could be validated at minimum once a year by a town clerk or their designee (e.g. a lister) for all surveys accumulated by a town in that year and performed at the time of the town's annual submission of their grand list (see recommendation 3). Validation could occur through an online form prepopulated with relevant information such as the surveyor's license number. In this way, validation of recorded digital surveys by a town serves to confirm the evidence of parcel line changes for that respective year while also providing a source for the town, vendor, and/or the state to make changes to their parcel linework.

Other states such as Arkansas have a similar survey library in place that may be used as an example.³ Vermont's Board of Land Surveyors is currently responsible for the upkeep and enforcement of professional standards and could establish in partnership with VCGI the digital requirements of surveys to be submitted to library, and of which a standard PDF format would be sufficient. While this recommendation is primarily focused on hosting surveys of newly created line adjustments to keep parcel data up to date in the future, it could also host historical surveys that are contributed by surveyors over time to add to the public records documenting land ownership.

This recommendation has several key components relevant to different existing statutes, including 27 V.S.A. § 1401 and 27 V.S.A. § 1403, all of which are linked in the related documents and legislation section. More detail of this option is provided in the minutes of the Digital Survey Advisory Group dated August 23, 2018 which is provided in the appendices.

³ See the [Arkansas Division of Land Surveys and Plat Search](#). Arkansas is in the public land survey system which makes it quite different from Vermont, yet the concept of a survey library is still applicable.

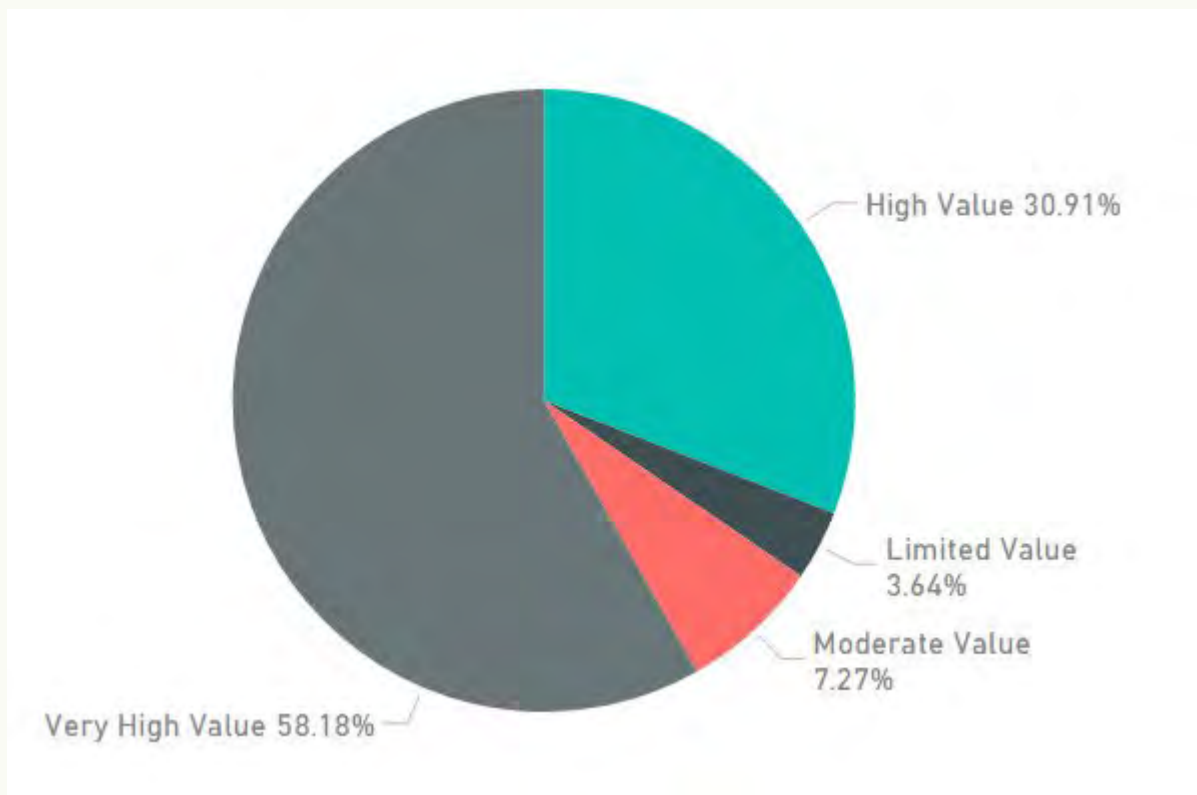


Figure 14. Responses of 56 polled licensed land surveyors to the question: What value would be provided by having access to a single statewide digital survey library?

In October 2017, VCGI polled the Vermont land surveying community to understand their thoughts on one possible long-term parcel maintenance option identified in the 2015 ROI report: the creation of a statewide survey library. This “survey of surveyors” was borne of the need to understand their satisfaction with existing access to land records in Vermont. There were 56 respondents to the survey administered to Vermont licensed land surveyors who are also members of the Vermont Society of Land Surveyors (VSLS), a sample representing just over one third of this group. Respondents were comprised largely of professionals with more than 20 years of experience.

89% of respondents replied that they see either “very high value” or “high value” in having access to a single statewide digital survey library for municipal land records (see Figure 14). Example uses of the survey library by this group would be to expedite records research, streamline records documentation for towns, and provide a venue for the storage of historical survey information. Overall this response from polled surveyors suggests strong support and ultimate use of a single, statewide survey library that contains both current and historical survey documents of property ownership in Vermont.

2. Require the recording of plats for changes in property lines and subdivisions

- a. Required survey plats to be only of modified lines, e.g. of boundary line adjustments and subdivisions

The second recommendation to ensure a reliable, up-to-date, comprehensive and useful parcel data set for Vermont is to require land surveys to be performed for changes in property lines. Currently there is no legislative requirement for surveys to be produced in municipalities without zoning/subdivision regulations. Considering that the initial three-year run of the parcel project will have digitized parcel lines for all Vermont municipalities, having a reliable source of line changes in the form of ground surveys performed by licensed land surveyors will improve the upkeep of line changes to this now statewide dataset.

The consistent recording of subdivision surveys in municipalities without bylaws will also be beneficial to listers and assessors, who currently do not have the option of requiring this information and must now undertake additional research to document property boundaries and ownership for properties that have been subdivided without a recorded survey.

The Board reviewed and considered survey requirements of other states and Canadian provinces, including: 1) requiring surveys for all real estate sales; 2) requiring georeferenced surveys with control point; 3) requiring review and acceptance of surveys by a central authority; and 4) requiring the submission of CAD files. While these measures would facilitate the maintenance and improve the quality of parcel data, the Board found that these requirements would either add substantive new costs or represent a challenge/cost to surveyors that would be required to change existing practices. Notably, requiring surveys for all real estate sales would add costs to a significant number of transactions, would be strongly opposed by the Realtors Association for potentially delaying transactions.

One question that came up frequently in considering this when surveys should be required was whether or not to require surveys of entire parcels involved in subdivisions or if they should

be limited to just new boundary lines and lots. Currently, some municipal regulations require the entirety of parcels to be surveyed, while others only require new lines to be. The oft cited example for not requiring entire parcels to be surveyed was the potential increase in costs for requiring very large parcels to be surveyed when only a small parcel is being carved off for sale or when there is a minor adjustment being made between two parcels. It is therefore the Board's recommendation that surveys should only be required of lines being adjusted and/or created, as opposed to requiring surveys of entire parcels. This recommended approach should avoid adding additional survey costs that would otherwise not have occurred.

A caveat with this recommendation is that there will be additional cost for a survey borne by any party subdividing/ adjusting a boundary line in those municipalities where it is not currently required by municipal law (see inset box on next page). Still, this survey requirement for line adjustments only appears the lowest cost and highest-effect option for maintaining an up-to-date parcel dataset for the entire state of Vermont. Timing-wise, digital copies of these surveys could be submitted to the survey library described in recommendation one by the surveyor at the time of delivery to their client and creation of a mylar for public recording purposes.

Recommendation two has bearing on existing statutes including 27 V.S.A. § 1401, 27 V.S.A. § 1403 and particularly, 27 V.S.A. § 341.

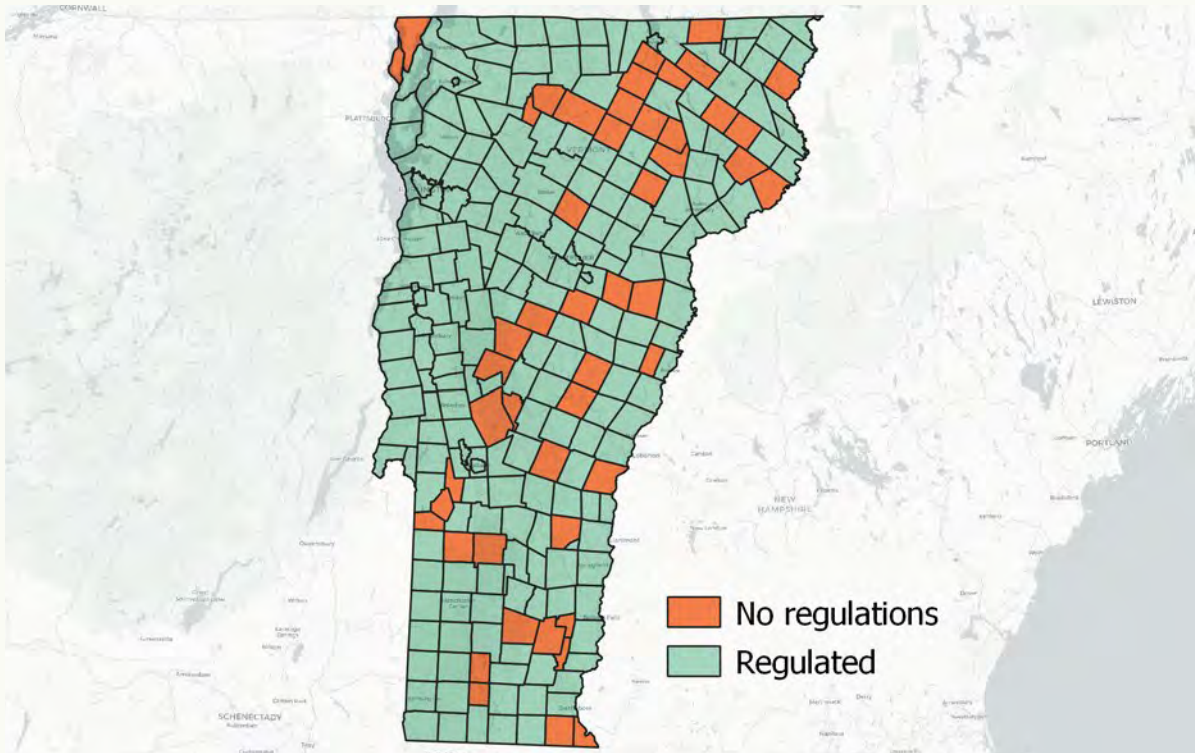


Figure 15. Vermont municipalities with and without land regulations. Municipalities with no regulations have no requirements to record plats for subdivisions or boundary line adjustments.

Most municipalities across the state currently regulate the division of parcels and require plats to be approved and recorded per 24 V.S.A. §4418. According to the most recent Agency of Commerce and Community Development data, there are 49 towns in Vermont that do not have subdivision or zoning regulations, and therefore do not have any requirements for the recording of plats. There are also several municipalities in Vermont with only Zoning regulations that may or may not regulate subdivisions and require surveys associated with development applications. For these towns, the recommendation to require the recording of survey plats may represent a change in the status quo.

In the 49 towns that do not have any regulations, we have seen low levels of subdivision activity, and found that often times surveys are recorded, even when not required. Given these relatively small numbers we expect that a new legislative requirement of surveys for new line adjustments and subdivisions not to introduce undue burden to property owners and towns and instead hold value as a viable long-term parcel data maintenance strategy.

3. Integrate parcel data with property information management system software

- a. Link parcel data and allow for its updating by municipal officials within property information management system software
- b. Consider requiring updates to town parcel information to be submitted and/or validated with the annual submittal of their grand list

The Department of Taxes is currently starting the process of updating the property information management system software used by Vermont municipalities. This new system could include functions that allow municipalities to maintain changes to parcel data through a map interface, assign and keep spatial attributes to these data, unify the creation and verification of new SPAN numbers, and submit changes to the state in real-time as parcel modifications occur. These updates could then form the basis of keeping the statewide parcel dataset current. This future system, if implemented in such a way, could ultimately supersede interim strategies to maintain parcel data when the program is completed in December 2019, and could be implemented through a phased rollout over the next several years.

Lastly, we recommend considering the requirement of municipal parcel changes to be submitted at least annually with the submittal of a town's grand list. This submittal could include the at-minimum once a year verification by each town of surveys associated with their parcel line changes, as described in recommendation one.

4. Implement a maintenance plan with shared state and local responsibilities

- a. Create a streamlined form and process for parcel data submission
- b. Consider designating a parcel coordinator for the state and each Regional Planning Commission
- c. Evaluate incentives for ongoing municipal maintenance of data that meets the parcel data standard, such as the modification of reappraisal payments
- d. Evolve contents of parcel data standard with

incorporation of enhancements

- e. Maintain relationships with professionals associated with parcel data creation and upkeep

Out of 133 individuals surveyed as part of the 2015 ROI study, most recommended a 'shared responsibility' maintenance model where some municipalities continue to update their own data and the state provides support for municipalities without the capacity to keep their data maintained. There are several actions recommended that support the desire to maintain local control while supporting those without capacity.

We recommend creating a streamlined online form for parcel data submission by towns, vendors, and/or RPCs in the interim time before a new property information management system is implemented by the Tax Department. This would be an online form with prespecified fields to properly categorize and identify updates to standardized parcel data. We also recommend considering the establishment of a designated municipal parcel coordinator for each Regional Planning Commission (RPC), and a single parcel coordinator for the state. Like an E911 coordinator required by 30 V.S.A. §7056 (a), a designated parcel coordinator for each RPC could be responsible for:

- Reminding their respective towns to submit this digital database of changes to their town's parcels to VCGI annually via a streamlined form
- In the absence of vendors who provide changes to tax maps and/or parcel maps for towns, assist with parcel map updates for their respective towns and submit copies of the updated digital files to VCGI annually for their edits to be included in the statewide parcel dataset. (This would be in the interim time between when (and if) this process could be included in the new property management system)
- Communicating to the VCGI that the municipality opts to have VCGI, RPC, or other entity maintain their data, should vendor, RPC, or local upkeep not be an option

Incentives should be considered for the ongoing maintenance of data that meets the parcel data standard. One example incentive would be to modify reappraisal payments. Currently, 32 V.S.A. §4041 (a) specifies that a municipality shall be paid \$8.50 per grand list parcel per year from the equalization account within the Education Fund. These payments are to be used only for reappraisal and costs related to reappraisal of its grand list properties and for maintenance of the grand list. In this current practice there is no incentive to 1) maintain standard-compliant parcel map data associated with the grand list, and 2) submit any mapping updates to the state along with the annual submission of a municipalities' grand list.⁴

We recommend evaluating the modification of 32 V.S.A. §4041 (a) to specify an increase in payment per grand list parcel per year for parcels that adhere to the parcel data standard while retaining the \$8.50 payment to those parcels submitted that are not standard-compliant.⁵

This option could be related with the property information management system, where this new system could be a means by which changes in parcel data are verified to be standard-compliant when transmitted by municipalities through the system. In this scenario municipal submission of standard-compliant parcel data via the updated property information management system would be eligible for the higher payment per parcel whereas non-standard compliant data would not.

The standards, documents, and procedures associated with parcel data maintenance could also be strengthened to support shared state and local parcel upkeep responsibilities. These enhancements may include (but may not be limited to):

⁴ Modifications to reappraisal payments may be considered in relation with the funded vendor upkeep of standardized parcel data. Participating vendors in the Parcel Program have estimated an average cost of \$1 per parcel for the annual upkeep of standardized parcel data for each town, with vendor cost estimates ranging from \$0.50 to \$2 per parcel for upkeep.

⁵ For reference, the per parcel reappraisal payment has been set at \$8.50 since 2005. It was \$6 when Act 60 passed in 1997. \$8.50 in 2005 dollars is the equivalent to \$11.27 in December 2018 dollars, per the CPI calculator. An increased per parcel reappraisal payment that more closely matches this figure, so long as parcels adhere to the state standard and are submitted at least annually, should be considered as an option for providing incentive to towns to maintain their parcel data.

Encouraging improvements and normalization with the Statewide Grand List

- Improving the management of acreage values, as nontaxed property is currently managed inconsistently within the Grand List.

Normalizing the tracking of condominiums

- Condominiums are currently tracked differently by municipalities. This also represents a source of inconsistency that could be improved through normalization.

Improving how property transfer returns are recorded and submitted to the Tax Department by municipalities

- Normalized, digital records of property transactions could potentially form the basis for a Statewide Grand List that is continually updated. These regular updates may then be used to update parcel data and keep it as current as the occurrence of property transfers.

Improving ease of public access to parcel data

- Standardized, statewide parcel data can be served in an interactive, dynamically-updated web mapping application. Several states such as [Utah](#) and [Massachusetts](#) have already implemented this kind of searchable, web-based, statewide parcel viewer. Functionality may include markup tools, easy listing of abutting properties, clear display of public information, and more. We have currently developed a similar parcel-specific viewer for Vermont and anticipate its public release in early 2019.

Adding feature-level metadata to parcel data

- Adding feature-level metadata to parcel data enables the storage and documentation of source information, date last modified and by whom, spatial accuracy, and more.

Adding easements to parcel data

- Inclusion of parcels classified as easements could improve the uses of parcel data.

Online Quality Control (QC) Tool

- The conversion of the QC tool into a geoprocessing service that allows the tool to run online, instead of locally, would accelerate the QC process and allow vendors to test data and view QC results remotely. Currently, non-Parcel Program data submissions are received via email. The creation of an online parcel data submission site would enhance the data transmission process and ensure that data is transmitted more effectively.

Statewide Parcel Fabric

- If statewide maintenance of parcel data becomes a possibility, it will be advantageous to use a system that keeps track of historical parcel information, manages control points, and leverages various parcel sources and surveys to incorporate the best existing land records information into statewide parcel data. Furthermore, this practice would open the door for foundational data of survey monuments to be shared between towns and help improve Vermont's town boundaries. This would be a next step from the survey library to a survey monument database, potentially leveraged from the digital surveys, if provided in CAD or GPS.

Maintaining relationships and communication between state, local, and groups associated with parcel data maintenance will be crucial to the long-term success of this effort. This includes parcel-related state employees, municipal map vendors, regional planning commissions, and professional groups such as the Vermont Assessors and Listers Association and the Vermont Municipal Clerks and Treasurers Association to expand opportunities for parcel data use and integration with records and record-keeping practices.

5. Transition Parcel Program to the Vermont Center for Geographic Information

- a. Amend 19 V.S.A. § 44 and/or 10 V.S.A. § 123 to transfer oversight of long-term parcel maintenance from VTrans to VCGI in 2020.

Lastly, we recommend formally acknowledging the transition of the long-term management of the parcel program to VCGI by amending 19 V.S.A. § 44 and/or 10 V.S.A. § 123 to transfer oversight of long-term parcel maintenance from VTrans to VCGI in July of 2020. This also has bearing on the potential sunset of the parcels advisory board, with the remaining applicable content of 19 V.S.A. § 44, potentially being moved to a more appropriate area, such as 10 V.S.A. § 129.

REFERENCES

1. Geospatial Data Act of 2018 (H.R. 302, P.L. 115-254). Retrieved from: <https://crsreports.congress.gov/product/pdf/R/R45348>
2. OMB Circular A-16. Retrieved from: https://www.fgdc.gov/policyandplanning/a-16/index_html
3. Vermont Statewide Digital Parcels Return on Investment (Roi) Study, September 16, 2015. Retrieved from: https://vcgi.vermont.gov/sites/vcgi/files/VT_ParcelROI_Report_2015_FINAL.pdf
4. Vermont Statewide Parcel Data Standard v.2.3. Retrieved from: https://vcgi.vermont.gov/sites/vcgi/files/standards/VT_GIS_Parcel_Data_Standard.pdf
5. Vermont Statewide Digital Parcel Lifecycle & Maintenance Plan. Retrieved from: http://vcgi.vermont.gov/sites/vcgi/files/VT_Parcel Data Lifecycle and Maintenance Plan_2015_FINAL.pdf

APPENDICES

APPENDIX A: STATEWIDE PROPERTY PARCEL ADVISORY PROGRAM STATUTE 19 V.S.A. § 44

Title 19: Highways

Chapter 001: State Highway Law; General Transportation Provisions

§ 44. Statewide Property Parcel Mapping Program

(a) Purpose. The purpose of the Statewide Property Parcel Mapping Program is to:

- (1) develop a statewide property parcel data layer;
- (2) ensure regular maintenance, including updates, of the data layer; and
- (3) make property parcel data available to State agencies and departments, regional planning commissions, municipalities, and the public.

(b) Property Parcel Data Advisory Board. The Property Parcel Data Advisory Board (Board) is created for the purpose of monitoring the Statewide Property Parcel Mapping Program and making recommendations to the Agency of how the Program can be improved to enhance the usefulness of statewide property parcel data for State agencies and departments, regional planning commissions, municipalities, and the public. The Board shall comprise:

- (1) the Secretary of Transportation or designee, who shall serve as chair;
- (2) the Secretary of Natural Resources or designee;
- (3) the Secretary of Commerce and Community Development or designee;
- (4) the Commissioner of Taxes or designee;
- (5) a representative of the Vermont Association of Planning and Development Agencies;
- (6) a representative of the Vermont League of Cities and Towns; and
- (7) a land surveyor licensed under 26 V.S.A. chapter 45 designated by the Vermont Society of Land Surveyors.

(c) Meetings of Board. The Board shall meet at the call of the Chair or at the request of a majority of its members. The Agency shall provide administrative assistance to the Board and such other assistance as the Board may require to carry out its duties.

(d) Standards. The Agency shall update the statewide property parcel data layer in accordance with the standards of the Vermont Geographic Information System (VGIS), as specified in 10 V.S.A. § 123 (powers and duties of Vermont Center for Geographic Information).

(e) Funding sources. Federal transportation funds shall be used for the development and operation of the Program. In fiscal year 2018 and in succeeding fiscal years, the Agency shall make every effort to ensure that all State matching funds are provided by other State agencies or external partners, or both, that benefit from the Program. (Added 2015, No. 158 (Adj. Sess.), § 37.)

APPENDIX B: ACT 158: STATEWIDE PROPERTY PARCEL MAPPING PROGRAM

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2016

* * * Statewide Property Parcel Mapping Program * * *

Sec. 35. DEVELOPMENT OF STATEWIDE PROPERTY PARCEL DATA LAYER

(a) The General Assembly finds that the State has an interest in creating a statewide property parcel data layer. The data layer will include all property parcels in each Vermont town, city, incorporated village, gore, and grant in a standard format and integrate all municipal property parcel maps into one property parcel map for the State.

(b) The General Assembly further finds that a statewide property parcel data layer will be useful to the Agency for the following applications:

- (1) mapping highway centerlines that end at property boundaries;
- (2) enabling the Agency to evaluate properties for alternative energy and other possible uses;
- (3) providing right-of-way data to analyze Transportation Separate Storm Sewer System (TS4) assessments;
- (4) streamlining title searches during the project development phase of transportation projects;
- (5) providing linkages between grand list and property parcel data in order to enable the identification of all public land;
- (6) locating encroachments on highways and providing notice to adjoining landowners;
- (7) mapping the locations of surplus and excess property;
- (8) assisting in the appraisal of land and acquisition of rights for

transportation projects;

(9) improving emergency response capabilities;

(10) identifying encroachments on State-owned railroads and providing notice to adjoining landowners;

(11) evaluating applications for highway access under 19 V.S.A. § 1111, including utility installations and driveways; and

(12) improving the State's ability to identify its assets by accurately cataloguing the location and extent of State-owned rights-of-way.

(c)(1) Consistent with Secs. 36–37 of this act, starting in fiscal year 2017, the Agency shall commence development of the statewide digital parcel data layer as part of the Statewide Property Parcel Mapping Program.

(2) According to the Agency:

(A) development of the data layer is expected to take three years;

(B) 80 percent of development costs and future operating costs are expected to be funded with Federal Highway Administration funds and 20 percent with State matching funds; and

(C) transportation funds will cover the 20 percent State match in fiscal year 2017.

(3) The Agency shall continue to work with State agencies and external partners benefited by the data layer, including private funding partners, to develop a memorandum of understanding to address funding sources other than the Transportation Fund for the 20 percent State match for fiscal year 2018 and in succeeding fiscal years.

Sec. 36. 19 V.S.A. § 10 is amended to read:

§ 10. DUTIES

The Agency shall, except where otherwise specifically provided by law:

* * *

(17) Administer the Statewide Property Parcel Mapping Program.

Sec. 37. 19 V.S.A. § 44 is added to read:

§ 44. STATEWIDE PROPERTY PARCEL MAPPING PROGRAM

(a) Purpose. The purpose of the Statewide Property Parcel Mapping Program is to:

- (1) develop a statewide property parcel data layer;
 - (2) ensure regular maintenance, including updates, of the data layer; and
 - (3) make property parcel data available to State agencies and departments, regional planning commissions, municipalities, and the public.
- (b) Property Parcel Data Advisory Board. A Property Parcel Data Advisory Board (Board) is created for the purpose of monitoring the Statewide Property Parcel Mapping Program and making recommendations to the Agency of how the Program can be improved to enhance the usefulness of statewide property parcel data for State agencies and departments, regional planning commissions, municipalities, and the public. The Board shall comprise:
- (1) the Secretary of Transportation or designee, who shall serve as chair;
 - (2) the Secretary of Natural Resources or designee;
 - (3) the Secretary of Commerce and Community Development or designee;
 - (4) the Commissioner of Taxes or designee;
 - (5) a representative of the Vermont Association of Planning and Development Agencies;
 - (6) a representative of the Vermont League of Cities and Towns; and
 - (7) a land surveyor licensed under 26 V.S.A. chapter 45 designated by the Vermont Society of Land Surveyors.
- (c) Meetings of Board. The Board shall meet at the call of the Chair or at the request of a majority of its members. The Agency shall provide administrative assistance to the Board and such other assistance as the Board may require to carry out its duties.
- (a) Standards. The Agency shall update the statewide property parcel data layer in accordance with the standards of the Vermont Geographic Information

System (VGIS), as specified in 10 V.S.A. § 123 (powers and duties of Vermont Center for Geographic Information).

(b) Funding sources. Federal transportation funds shall be used for the development and operation of the Program. In fiscal year 2018 and in succeeding fiscal years, the Agency shall make every effort to ensure that all State matching funds are provided by other State agencies or external partners or both that benefit from the Program.

VT Center for Geographic Information

VT GIS Parcel Data Standard

Version 2.3, Adopted on October 20, 2016



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

Vermont GIS Parcel Data Standard

Updates

Date	Notes
March 2012	Version 1.0
November 2013	Version 1.1
August 19, 2016	Version 2.0, Draft posted for public comment
October 12, 2016	Version 2.1, Intermediate revised draft
October 16, 2016	Version 2.2, Intermediate revised draft
October 20, 2016	Version 2.3, Adopted by Vermont Enterprise GIS Consortium (EGC)

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 and useful to others in the VT GIS community.

The VT GIS Parcel Data Standard was adopted following the procedure established in VCGI's "Adoption of VT GIS Standards and Guidelines" Version 1.0. A draft of the standard was released for public comment on August 19th, 2016 and the State's Enterprise GIS Consortium (EGC) voted to approve the standard on October 20th 2016.

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

Introduction

GIS (geographic information system) parcel data is the digital geographically-referenced data used to model the locations of parcel boundaries and unlanded buildings, along with associated attribute information, for input to geospatial analysis and production of municipal tax maps. Although GIS parcel data cannot replace detailed ground surveys, the data does assist municipal officials with functions such as accurate property tax assessment, economic development, conservation, planning, zoning, and public safety. Towns can link their GIS parcel data to their electronic municipal Grand List data and display local information. Officials can show tax-payers 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.

Definitions

Real Estate - Land, improvements to the land, and certain buildings.

Grand List - As of April 1st of any given year, a list that contains a brief description and the listed valuation of each separate piece or parcel of taxable real estate.

Parcel – State statute defines a parcel as *“all contiguous land in the same ownership, together with all improvements thereon”* (32 V.S.A. § 4152(a)(3)). Though not specifically stated above, the accepted interpretation is that division of a tract by a road does not create two parcels. The Vermont GIS Parcel Data Standard requires that each parcel or unlanded building of the Grand List be modeled in GIS data. Examples of parcels and unlanded buildings that are modeled in GIS data per this standard include but are not limited to:

- lot within a subdivision
- condominium unit
- condominium common land²
- mobile home on leased land
- camp on leased land

² In some instances, a deed specifies a percentage of common land ownership to each condominium unit and the common land does not have a SPAN number. In other instances, a deed does not allocate the common land and the common land does have a SPAN number.

Unlanded Building – Condominium unit, mobile home, camp, or other building that is a unit of real estate which is separate from the underlying land surface. In some cases, the underlying land is rented.

Active Parcel and Inactive Parcel – Sometimes, when two or more abutting parcels have the same owner, one of those parcels is considered the main parcel, or active parcel, to which a single collective tax bill is associated for all of the parcels. The other parcels are inactive. In these cases, all of the parcels are collectively modeled as one parcel with attribution of the active parcel in the active parcels data layer per this standard; Inactive parcels are modeled in a separate data layer. When the owner of one of the inactive parcels becomes different, that parcel becomes active. Both active and inactive parcels have SPAN numbers.

SPAN - School Property Account Number - A unique, state-assigned identification number for each parcel / unlanded building. SPAN number information is critical to database synergy between Vermont GIS parcel data and Grand List data.

Multi-part Non-contiguous Parcel – Sometimes, a non-contiguous geometry object (multi-part polygon) is required in order to model one Grand List record as one record in the GIS data.



Public Right-of-Way – An area that is legally dedicated to public right-of-way purpose. Ingress/egress easements or “private right-of-way easements” that overlay underlying parcels are **NOT** considered to be public right-of-ways and are **NOT** considered to be parcels. Public right-of-way areas do not have SPAN numbers.

Ingress-Egress Easement / Private Right-of-Way – Ingress-egress easements or “private right-of-way easements” are arranged for access to locations by traversing one or more parcels. Ingress-egress easements that overlay underlying parcels are **NOT** considered to be public right-of-ways and are **NOT** considered to be parcels.

Map ID - Unique parcel identifier, determined by the municipality, which is distinct from the unique identifier in the Grand List.

Discrepancy List - List of properties with ownership or area conflicts/uncertainty above a threshold agreed upon by municipality and map consultant.

Shapefile – A GIS data format that is widely used in proprietary and open source realms of GIS software. The shapefile format allows data layers to be created with geometry types that include points, lines, and polygons.

dBASE (.dbf) – A tabular data format in which tabular information is stored, either as a component of a shapefile and or as a stand-alone table.

Geodatabase – A data storage format that is based on relational database concepts. The geodatabase format can store spatial and non-spatial data types and supports complex data object relationships. The geodatabase format is scalable from the file-based “file geodatabase” (.gdb) implementation to an enterprise implementation within enterprise-oriented DBMS systems. The geodatabase format allows data layers to be created with geometry types that include points, lines, and polygons; The geodatabase format also allows creation and storage of annotation data layers.

Feature Class – Feature classes stored within a geodatabase and shapefiles are both considered to be feature classes.

Metadata - Documentation about the data, including date, source, and provider.

Objectives of this Data Standard

1. Define technical requirements for municipalities to utilize when creating or updating GIS parcel data. Separate levels of this standard will allow municipalities to pick a level suitable for procurement, budget, and resource considerations and ensure that high quality and reliable parcel information products are developed. This standard provides an extensible framework that serves as a foundation for production of supersets of the standard levels for particular municipal business needs.
2. Establish common data elements and ensure consistency between different municipal GIS parcel data sets to ensure that all delivered municipal GIS parcel datasets can be merged into a single statewide dataset without translation. The common data elements and data consistency provide a framework that yields efficient exchange of parcel data and parcel data aggregation.

Applicability of this Data Standard

The Transportation Bill of 2016 (Act 158)³ created the Statewide Property Parcel Mapping Program by which a statewide digital parcel data layer (data set) will be developed, maintained, and made available to state government, regional planning commissions, municipalities, and the public.

³ <http://legislature.vermont.gov/bill/status/2016/H.0876>

Compliance with this standard is required for any contracts or arrangements for creation of GIS parcel data through the Statewide Property Parcel Mapping Program.

GIS parcel data is a recommended source for municipal tax maps. Municipal tax maps are for tax assessment purposes and, unlike areas outside New England, are not the legal (cadastral) record of property ownership. While property boundaries on assessor maps often serve as a proxy for ownership, any authoritative representation of property ownership must be based on records from the municipality and/or work by a licensed professional land surveyor. Please note that this standard is NOT a general purpose standard for traditional printed parcel map sheets.

This standard applies to development of digital versions of municipal parcel maps for use in planning, property assessment, and graphic map display.

Templates are Available

VCGI provides shapefile, .dbf table, geodatabase, and metadata templates that can help in the conversion to, or creation of, data that meets levels of the Vermont GIS Parcel Data Standard. Go to vcgi.vermont.gov or call 802-882-3005 for more information.

Explanation of Levels

Level 1 is meant to describe the minimum components and characteristics of GIS parcel data that are required in order to meet the objectives identified above. Level 2 provides a framework for developing an extended and/or enhanced GIS parcel data set.

Municipal-Level Database Schema Dependencies

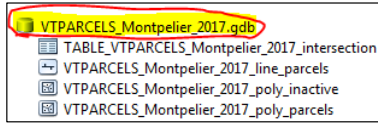
Some municipalities have technical applications and business processes that require the existence of certain database schema elements in their GIS parcel data assets. Those schema dependencies can vary from the feature class and table specifications that are articulated in the requirement levels of this standard. In these cases, VCGI encourages municipalities and/or their mapping contractors to enhance and add value to those parcel data assets by providing extract-transform-load (ETL) utilities that use field-mapping to generate “publishing” data sets that are on accord with a requirement level of this standard.

Data Format Requirement

For each municipality, all geospatial and tabular data are delivered as **either** a single version 10.x or higher file geodatabase (.gdb) **or** a set of shapefiles and dBASE (.dbf) files. Each file geodatabase or set of shapefiles and dBASE files must be accompanied by a metadata file in FGDC CSDGM⁴ XML format.

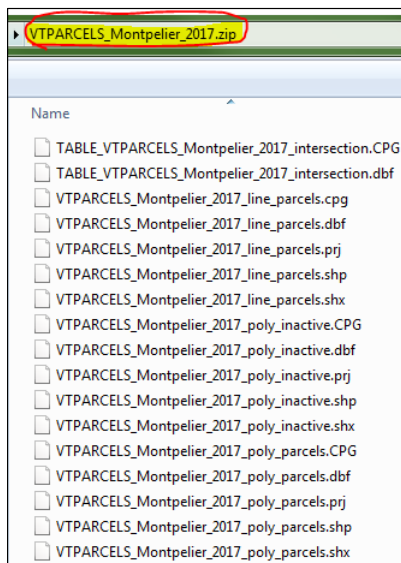
Top-Level Deliverable File Naming Requirement

If a municipality's data is delivered in geodatabase format, then all geospatial and tabular data must be within a single version 10.x or higher file geodatabase that is named VTPARCELS_<town name>_<YYYY>.gdb, where YYYY represents the Grand List year (year of April 1st Grand List) to which the data is current. For example:

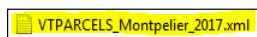


If a municipality's data is delivered as a set of shapefiles and dBASE (.dbf) files, then all geospatial and tabular data must be within a single compressed file, in .zip format, that is named VTPARCELS_<town name>_<YYYY>.zip, where YYYY represents the Grand List year (year of April 1st Grand List) to which the data is current. For example:

⁴ Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata. See <https://www.fgdc.gov/metadata/csdgm/>.



All deliveries must be accompanied by a stand-alone FGDC CSDGM metadata file in XML format that is named VTPARCELS_<town name>_<YYYY>.xml, where YYYY represents the Grand List year (year of April 1st Grand List) to which the data is current. For example:



Metadata Content Requirement

For each municipality, a single metadata file, in FGDC CSDGM⁵ XML format, is required. All feature classes (or shapefiles) and non-spatial tables are documented in that metadata file. Content is required for the following core metadata elements:

- Identification_Information/Citation/Citation_Information/Title
- Identification_Information/Citation/Citation_Information/Originator
- Identification_Information/Citation/Citation_Information/Publication_Information/Publisher
- Identification_Information/Description
- Identification_Information/Time_Period_of_Content
 - The Grand List year to which the data is current, using the format YYYY. The date of Grand List export for use in parcel data development shall be noted.
- Identification_Information/Spatial_Domain
- Identification_Information/Use_Constraints
 - Populate this attribute with the following disclaimer: *"This data layer is not a legal survey. It is not a legal conveyance or description of property and is intended for planning purposes only. VCGI and the State of VT make no representations of any kind, including but not limited to the warranties of merchantability or fitness for a particular use, nor are any such warranties to be implied with respect to the data."*
- Data_Quality_Information
 - Include Lineage with Source_Information and Process_Step(s).
- Entity_and_Attribute_Information
 - Include an individual Detailed_Description for every feature class (or shapefile) and non-spatial table. Provide Attribute information for all fields.

Coordinate System and Datum Requirement

All geospatial data must be in Vermont State Plane Meters, NAD 83 (National Spatial Reference System (NSRS) or most current)).

⁵ Federal Geographic Data Committee Content Standard for Digital Geospatial Metadata. See <https://www.fgdc.gov/metadata/csdgm/>.

Level 1: GIS Parcel Data Standard Requirements

A. Feature Classes and Tables – The delivery includes feature classes and tables that are described in the following tables.

Feature Class Name = VTPARCELS_<Town Name>_<YYYY>_line_parcels			
<ul style="list-style-type: none"> • Description = A line counterpart to the VTPARCELS_<Town Name>_<YYYY>_poly_parcels feature class. Boundary geometries of the VTPARCELS_<Town Name>_<YYYY>_poly_parcels feature class are sourced from this feature class. <u>This feature class only includes lines related to parcels that have active SPAN numbers.</u> • This feature class can be used for symbolizing parcel boundaries by type. • Geometry Type = line 			
Field Name	Description	Field Type	Allowed Values
PLTYPE	Line type	Text, length of 9	No Null values or empty strings. See Appendix D for valid values.
PARCBOUND	A Boolean-like field to indicate if the line is part of a parcel boundary	Text, length of 1	No Null values or empty strings. Enter Y for yes (line is part of a parcel boundary) or N for no.
YEAR	Grand List Year that mapping data represents	Short Integer	Year as represented by 4 digits. No Null values or zeros.
TOWN	Name of the town, city, gore, or grant	Text, length of 30	No Null values or empty strings. See Appendix E for valid values.
SOURCENAME	Name of the source information	Text, length of 80	Entry is optional. Null values or empty strings are allowed.
SOURCETYPE	Type of source information	Text, length of 19	See Appendix C. No Null values or empty strings.
SOURCEDATE	Date of the source information	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern. If MM and/or DD are not known, then fill those portions with zeros. If the source date is not known, enter UNKNOWN.

EDITMETHOD	The method of capturing the feature's geometry	Text, length of 20	No Null values or empty strings are allowed. See Appendix F for valid values.
EDITOR	Name of editor that added or modified the feature	Text, length of 50	No Null values or empty strings. If the editor is unknown, such as in the case of pre-existing GIS data, enter UNKNOWN.
EDITDATE	The date on which the feature was added or modified	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern, or, if the edit date is not known, enter UNKNOWN.
EDITNOTE	Stores additional helpful information on the feature	Text, length of 254	Entry is optional. Null values or empty strings are allowed. Text, up to the length of the field.

Feature Class Name = VTPARCELS_<Town Name>_<YYYY>_poly_parcels

- Description = **Active** parcels (excluding unlabeled structures), public right-of-ways, trail right-of-ways (for trails identified on the VTTrans General Highway Maps, AKA Town Highway Maps), and surface water areas that serve as property boundaries. This feature class should consist of polygon features for all active parcels (excluding unlabeled structures) listed in the municipality's Grand List.
- Ingress/egress easements or "private right-of-way" easements that overlay underlying parcels are **NOT** considered to be public right-of-way and are **NOT** considered to be parcels. Easement data is **NOT** required for Level 1 of this standard. If easements are included in the delivery, they should be modeled within additional separate feature class(es).
- Geometry Type = polygon
- Each Grand List record must only be modeled as one record in the GIS data. A single non-contiguous geometry object (multi-part polygon) should be used to model a non-contiguous multi-part parcel. The SPAN field must not contain duplicate SPAN numbers.
- Mapping parcels to the public right-of way line rather than to the road centerline is a suggested best practice.

Field Name	Description	Field Type	Allowed Values
SPAN	Unique number assigned by VT Dept. of	Text, length of 13	SPAN number of the parcel as listed in the Grand List (nnn-nnn-nnnnn), or, if the feature

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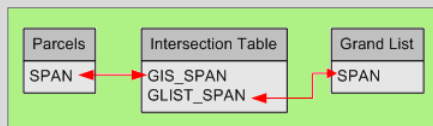
	Taxes		<p>represents an area to which a SPAN would not be assigned, such as a public right-of-way or water area, value is Null or empty string.</p> <p>Only 1 record can be attributed with a particular SPAN number (no duplicate SPAN numbers).</p> <p>If the feature is condominium common land that has no SPAN number, then populate this field with a combination of the FIPS6 code of the municipality and the next available integer as specified in Appendix A.</p> <p>Otherwise, if the SPAN number of the parcel is not known, a presumed/predicted SPAN number can be entered (which will be flagged as non-matching via the TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection table).</p>
MAPID	Unique identification of the parcel assigned by town	Text, length of 80	Text up to length of field
PROPTYPE	Type of property/area	Text, length of 9	See Appendix B for valid entries. No Null values or empty strings.
YEAR	Grand List Year that mapping data represents	Short Integer	Year as represented by 4 digits. No Null values or zeros.
TOWN	Name of the town, city, gore, or grant	Text, length of 30	No Null values or empty strings. See Appendix E for valid values.
SOURCENAME	Name of the source information	Text, length of 80	Entry is optional. Null values or empty strings are allowed.

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SOURCETYPE	Type of source information	Text, length of 19	See Appendix C. No Null values or empty strings.
SOURCEDATE	Date of the source information	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern. If MM and/or DD are not known, then fill those portions with zeros. If the source date is not known, then enter UNKNOWN.
EDITMETHOD	The method of capturing the feature's geometry	Text, length of 20	See Appendix F for valid entries. No Null values or empty strings.
EDITOR	Name of editor that added or modified the feature	Text, length of 50	No Null values or empty strings. If the editor is unknown, such as in the case of pre-existing GIS data, enter UNKNOWN.
EDITDATE	The date on which the feature was added or modified	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern, or, if the edit date is not known, enter UNKNOWN.
MATCHSTAT	The status of matching/relating the Grand List to this feature by SPAN number	Text, length of 9	No Null values or empty strings. Enter MATCH if the record's SPAN number can be matched/related to an active SPAN number in the Grand List. Enter EXEMPT if the record models a feature that should be exempted from the match, such as condominium common land which has no SPAN number, public right-of-way, or water. Otherwise, enter UNMATCHED.
EDITNOTE	Stores additional helpful information on the feature	Text, length of 254	Entry is optional. Null values or empty strings are allowed. Text, up to the length of the field.

Table Name = TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection

- Description = An intersection table that relates records of the municipality's Grand List which have active SPAN numbers to records in the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class which represent parcel features (PROPTYPE = 'PARCEL'). Supports bi-directional matching/reconciliation between the municipality's Grand List and the parcels feature class.



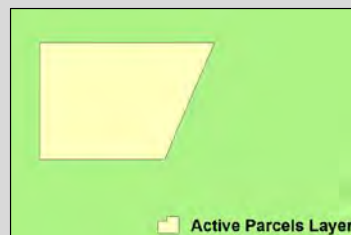
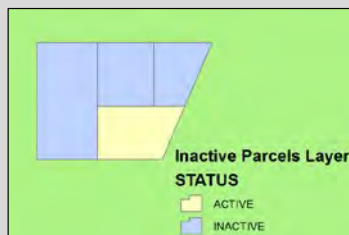
- Can be used to identify Grand List records of unlanded buildings (condominium units, unlanded mobile homes, unlanded camps, etc.) which are located on a particular land parcel.
- Can be used to identify the land parcel on which a particular unlanded building, as listed in the Grand List, is located.
- Can be used to identify mismatches between the municipality's Grand List and the GIS parcel data.
- Use a .dbf file if submitting data in shapefile format. Otherwise, use a geodatabase table.

Field Name	Description	Field Type	Allowed Values
GIS_SPAN	<p>The SPAN number exactly as attributed in the SPAN field of the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class.</p> <p>All unique SPAN entries of the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class that represent parcel features (PROPTYPE =</p>	Text, length of 13	Duplicate SPAN numbers are valid in cases where there is a one-to-many relationship between the parcel feature and Grand List records. For example, if the parcel feature is condominium common land on which unlanded buildings are located, then the SPAN of that common land parcel would be entered multiple times in this column, once for each unlanded building and sometimes once again for the common land parcel itself (if the common land has a SPAN in the Grand List). Continued on next page...

	'PARCEL') must be reflected in this field.		Null values or empty strings are allowed when the GIS counterpart of an active SPAN number is not known.
GLIST_SPAN	SPAN number exactly as listed in the municipality's Grand List as an active SPAN. Corresponds to the value of the GIS_SPAN field. All active SPAN numbers of the municipality's Grand List must be reflected in this field.	Text, length of 13	No duplicate entries, except for Null values or empty strings that occur when the Grand List counterpart of the GIS_SPAN field entry is unknown.
YEAR	Grand List Year that mapping data represents	Short Integer	Grand List year as represented by 4 digits. No Null values or zeros.
TOWN	Name of the town, city, gore, or grant	Text, length of 30	No Null values or empty strings. See Appendix E for valid values.

Feature Class Name = VTPARCELS_<Town Name>_<YYYY>_poly_inactive

- Description = **Inactive** parcels and their related **Active** parcels. This feature class should consist of features for all **Inactive** parcels listed in the municipality's Grand List and their related **Active** parcels.
- A cluster of inactive parcels and their related active parcel are modeled as individual parcels in this feature class while collectively modeled as one all-encompassing active parcel in the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class.



- Geometry Type = polygon
- Each Grand List record must only be modeled as one record in the GIS data. A single non-contiguous geometry object (multi-part polygon) should be used to model a non-contiguous multi-part parcel.
- Mapping parcels to the public right-of-way line rather than to the road centerline is a suggested best practice.

Field Name	Description	Field Type	Allowed Values
STATUS	Indicates if the parcel is an Active parcel or an Inactive parcel	Text, length of 8	Allowed values are ACTIVE and INACTIVE. No Null values or empty strings.
PARENTSPAN	Unique number assigned by VT Dept. of Taxes	Text, length of 13	Only populate this field if the parcel is an Inactive parcel. SPAN number of the Active parcel which is related to the Inactive parcel. Enter the SPAN

			number as listed in the Grand List (nnn-nnn-nnnnn).
SPAN	Unique number assigned by VT Dept. of Taxes	Text, length of 13	SPAN number of the parcel as listed in the Grand List (nnn-nnn-nnnnn). Only 1 record can be attributed with a particular SPAN number (no duplicate SPAN numbers).
MAPID	Unique identification of the parcel assigned by town	Text, length of 80	Text up to length of field
PROPTYPE	Type of property/area	Text, length of 9	Enter PARCEL. If using a geodatabase, the default entry can be set to PARCEL. No Null values or empty strings.
YEAR	Grand List Year that mapping data represents	Short Integer	Year as represented by 4 digits. No Null values or zeros.
TOWN	Name of the town, city, gore, or grant	Text, length of 30	No Null values or empty strings. See Appendix E for valid values.
SOURCENAME	Name of the source information	Text, length of 80	Entry is optional. Null values or empty strings are allowed.
SOURCETYPE	Type of source information	Text, length of 19	See Appendix C. No Null values or empty strings.
SOURCEDATE	Date of the source information	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern. If MM and/or DD are not known, then fill those portions with zeros. If the source date is not known, enter UNKNOWN.
EDITMETHOD	The method of capturing the feature's geometry	Text, length of 20	See Appendix F for valid entries. No Null values or empty strings.

EDITOR	Name of editor that added or modified the feature	Text, length of 50	No Null values or empty strings. If the editor is unknown, such as in the case of pre-existing GIS data, enter UNKNOWN.
EDITDATE	The date on which the feature was added or modified	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern, or, if the edit date is not known, enter UNKNOWN.
MATCHSTAT	Only applicable if the parcel is an Inactive parcel (STATUS=INACTIVE'). The status of matching the Inactive SPAN number to an Inactive SPAN number in the Grand List.	Text, length of 9	Entry is optional. Null values or empty strings are allowed. Enter MATCH if the record's SPAN number can be matched to an inactive SPAN number in the Grand List. Otherwise, enter UNMATCHED.
EDITNOTE	Stores additional helpful information on the feature	Text, length of 254	Entry is optional. Null values or empty strings are allowed. Text, up to the length of the field.

B. Topology/Geometry Requirements

1. Lines of VTPARCELS_<Town Name>_<YYYY>_line_parcel **Must Not Overlap**. Lines cannot share segments.
2. Lines of VTPARCELS_<Town Name>_<YYYY>_line_parcel **Must Not Intersect**. Lines cannot cross one another. Lines can share the same endpoints.
3. Lines of VTPARCELS_<Town Name>_<YYYY>_line_parcel **Must Not Self-Intersect**. Lines cannot cross themselves.
4. Polygons of VTPARCELS_<Town Name>_<YYYY>_poly_parcel **Must Not Overlap**. Polygons can share edges or vertices.

5. For polygons of VTPARCELS_<Town Name>_<YYYY>_poly_parcel, **Boundary Must Be Covered By** lines of VTPARCELS_<Town Name>_<YYYY>_line_parcel.
6. Polygons of VTPARCELS_<Town Name>_<YYYY>_poly_parcel **Must Not Have Gaps**. No void areas are allowed within polygons or between polygons.
7. Polygons of VTPARCELS_<Town Name>_<YYYY>_poly_inactive **Must Not Overlap**. Polygons can share edges or vertices.
8. For VTPARCELS_<Town Name>_<YYYY>_poly_inactive, **edges of a cluster of polygons must share edges** of a polygon in VTPARCELS_<Town Name>_<YYYY>_poly_parcel.
9. Polygons are closed at the town boundary.
10. Polygon feature classes do not have sliver polygons.
11. For VTPARCELS_<Town Name>_<YYYY>_poly_inactive, the aggregated polygon areas of an active parcel and its related inactive parcels must equate to the area of the active parcel as modeled in VTPARCELS_<Town Name>_<YYYY>_poly_parcel (all pieces add up to the whole).
12. No feature classes may contain any Null/empty geometry objects whatsoever.

C. Requirement for SPAN Match

At least 99% of records with active SPAN numbers in the municipality's Grand List can be joined to SPAN field entries of the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class via the following three steps. First, the TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection table is joined to the municipality's Grand List (records with active SPAN numbers only) by SPAN number via its GLIST_SPAN field. Second, the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class is joined to the result of the first join by SPAN number via the GIS_SPAN field of the TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection table. Third, in the result of joining in the second step, if at least 99% of Grand List records have a joined SPAN number from the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class, then the requirement for SPAN match is met.

Level 2: GIS Parcel Data Standard Requirements

Level 2 **includes Level 1 requirements** and the following requirements. It provides a framework for an enhanced parcel data set.

A. Feature Classes and Tables - The delivery includes feature classes and tables that are described in the following tables.

Feature Class Name = VTPARCELS_<Town Name>_<YYYY>_poly_easements			
<ul style="list-style-type: none"> Description = This feature class is optional, unless specified as required in contract. Easements, such as ingress/egress and access easements. Contracts should specify particular easement types to be modeled. Ingress/egress easements or "private right-of-way" easements that overlay underlying parcels are NOT considered to be parcels. Those easements can be modeled within this feature class. Geometry Type = polygon Each multi-part non-contiguous easement is modeled by one multi-part feature. 			
Field Name	Description	Field Type	Allowed Values
ESMTTYPE	Easement type	Text, length of 20	See Appendix G. Otherwise, Null values or empty strings are allowed.
SOURCENAME	Name of the source information	Text, length of 80	Entry is optional. Null values or empty strings are allowed.
SOURCETYPE	Type of source information, such as plat	Text, length of 19	No Null values or empty strings.
SOURCEDATE	Date of the source information	Text, length of 8	No Null values or empty strings are allowed. If the source date is not known, enter UNKNOWN. Otherwise, use an eight-character string that follows the YYYYMMDD pattern. If MM and/or DD are not known, then fill those portions with zeros.

EDITMETHOD	The method of capturing the feature's geometry	Text, length of 20	No Null values or empty strings are allowed. See Appendix F for valid values.
EDITOR	Name of editor that added or modified the feature	Text, length of 50	No Null values or empty strings. If the editor is unknown, such as in the case of pre-existing GIS data, enter UNKNOWN.
EDITDATE	The date on which the feature was added or modified	Text, length of 8	No Null values or empty strings. Use an eight-character string that follows the YYYYMMDD pattern, or, if the edit date is not known, enter UNKNOWN.
EDITNOTE	Stores additional helpful information on the feature	Text, length of 254	Text, up to the length of the field. Null values or empty strings are allowed.

B. Additional Requirement for SPAN Match (in addition to SPAN Match required by Level 1)

At least 99% of records in the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class which represent parcels (PROPTYPE = 'PARCEL') can be joined to records with active SPAN numbers in the municipality's Grand List via the following three steps. First, the TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection table is joined to records of the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class that have a PROPTYPE field entry of PARCEL (PROPTYPE = 'PARCEL') by SPAN number via its GIS_SPAN field. Second, the municipality's Grand List (records with active SPAN numbers only) are then joined to the result of the first join by SPAN number via the GLIST_SPAN field of the TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection table. Third, in the result of joining in the second step, if at least 99% of VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class records have a joined SPAN number from the Grand List, then the requirement for additional SPAN match is met.

Appendix A

Use of FIPS6 Code and Integer to Assign a Unique Identifier to Condominium Common Land

In some instances, a deed specifies a percentage of common land ownership to each condominium unit and the common land does not have a SPAN number. In other instances, a deed does not allocate the common land and the common land does have a SPAN number.

In cases when the common land does not have a SPAN number, the SPAN field of the VTPARCELS_<Town Name>_<YYYY>_poly_parcel feature class should be populated with a unique value in lieu of a SPAN number per the following pattern:

C-<FIPS6 code of the locality⁶>-<next unused integer, starting with 1>

For example, the first instance of common condominium land with no SPAN number in Williston would have a SPAN value of:

C-7085-1

The second instance would be assigned the following value for the SPAN number:

C-7085-2

The purpose of these SPAN value "fillers" is to provide common land with a unique identifier that can be used to relate the common land to unlanded condo units entered from the Grand List within the TABLE_VTPARCELS_<Town Name>_<YYYY>_intersection table.

⁶ FIPS6 code according to the VGIS Handbook – Geographic Area Codes, http://vcgi.vermont.gov/sites/vcgi/files/standards/partii_section_e.pdf

Appendix B

Valid PROPTYPE Values

Value	Description
PARCEL	Parcel
ROW_ROAD	Public road right-of-way
ROW_RAIL	Railroad right-of-way
ROW_TRAIL	Legal trail right-of-way as defined on the VTrans General Highway Maps
WATER	Surface water area that serves as property boundary

Appendix C

Valid SOURCETYPE Values

Value	Description
SURVEY/PLAT	Survey or plat
DEED	Deed
LINES OF OCCUPATION	Boundary, such as a stone wall, that is not very visible on the ground but might be detected by technologies such as lidar or ortho imagery.
SCANNED TAX MAP	Scanned tax map
NON-SCANNED TAX MAP	Non-scanned paper tax map
UNKNOWN	Unknown, such as pre-existing parcel GIS data
MULTIPLE	Multiple sources

Appendix D

Valid PLTYPE Values

Code	Description
PARCEL	Parcel boundary only
ROW_ROAD	Edge of public road right-of-way
ROW_RAIL	Edge of railroad right-of-way
ROW_TRAIL	Edge of legal trail right-of-way as defined on the VTrans General Highway Maps
WATER	Edge of surface water area that serves as property boundary
VILLAGE	Village boundary
TOWN	Town boundary
STATE	State boundary
COUNTRY	International boundary
BREAKLINE	Division of status or name (not for map display)
DISPUTE	Parcel boundary whose location is disputed
HOOK	Parcel hook for cartographic presentation

Appendix E

Valid TOWN Values

Use the name of the locality as specified in the COMMNAME field of the commcode.dbf table of VCGI's *Lookup tables with codes corresponding to the VGIS Geographic Area Codes Standard (GEOCODES)*⁷ data product (can be found at the VT Open Geodata Portal: <http://geodata.vermont.gov/>). Filter for COMMNAME values TOWN, CITY, GRANT, and GORE. Must be in all capital letters, with apostrophes removed (for example, AVERYSGORE). For more information on Vermont's geographic area names, see the *VGIS Handbook – Geographic Area Codes*⁸.

{please note that this appendix was minimally edited on June 7, 2017. The definition of valid TOWN values was not changed, but the wording was changed to clarify how to generate valid TOWN names from the commcode.dbf table}

⁷ <http://vcgi.vermont.gov/warehouse/products>

⁸ http://vcgi.vermont.gov/sites/vcgi/files/standards/partii_section_e.pdf

Appendix F

Valid EDITMETHOD Values

Code	Description
HEADS UP DIGITIZING	Capturing geometry into a layer that is superimposed to underlying source data, such as aerial imagery
COORDINATED COGO	COGO line work placed in real-world coordinates
NON-COORDINATED COGO	COGO line work placed by best fit to other evidence
COORDINATED CADD	CADD line work placed in real-world coordinates
NON-COORDINATED CADD	CADD line work placed by best fit to other evidence
GIS GRADE GPS	GIS-grade GPS collection
RTK GPS	High-precision GPS collection conducted with Real-Time Kinematic (RTK) positioning
OTHER	
UNKNOWN	

26

Appendix G

Valid ESMSTYPE Values

Code	Description
ACCESS	ACCESS EASEMENT
ROW	RIGHT OF WAY EASEMENT
RAILROAD	RAILROAD EASEMENT
CONSERVATION	CONSERVATION EASEMENT
FLOOD	FLOOD EASEMENT
SEWER	SEWER EASEMENT
WATER	WATER EASEMENT
DRAINAGE	DRAINAGE EASEMENT
GAS	GAS EASEMENT
OIL	OIL EASEMENT
ELECTRIC	ELECTRIC EASEMENT
UTILITY	UTILITY EASEMENT
LAND USE RESTRICTION	LAND USE RESTRICTION
ZONING RESTRICTION	ZONING RESTRICTION
MISC	MISC EASEMENT
UNKNOWN	UNKNOWN EASEMENT

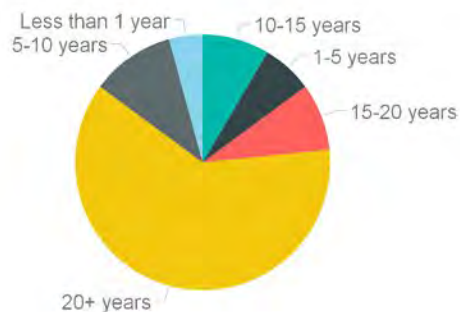
27

Survey of Surveyors

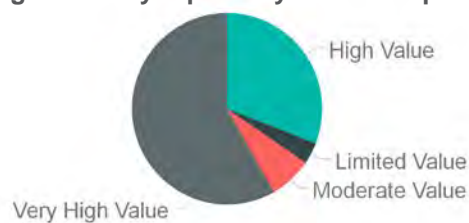
10/2017 56 respondents

 SurveyMonkey

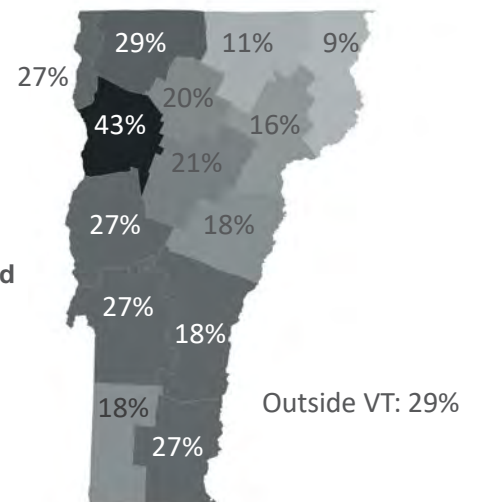
Q1: How many years have you been a licensed surveyor?



Q3: How much value do you see in having access to a centralized statewide digital survey repository for municipal land records?



Q2: Where do you generally perform surveys? (Select all that apply.)



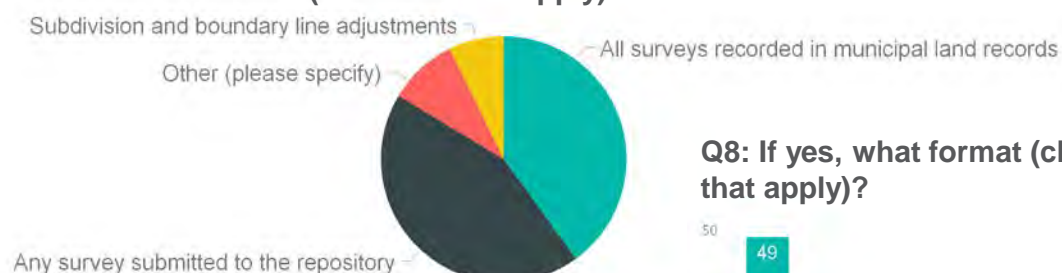
Q4: Please rate your overall level of satisfaction with existing access to surveys recorded in municipal offices.



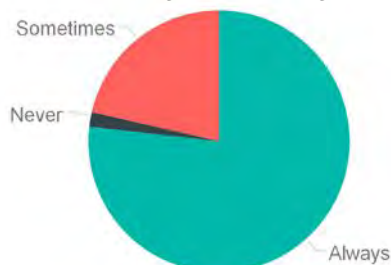
Q5: Is there any particular state, county, or municipality that you think does an excellent job in making surveys available?

New Hampshire (11)	Cheshire County, NH (2)	Brattleboro (2)	Royalton (1)
Massachusetts (4)	Franklin County, MA (1)	Underhill (1)	Colchester (1)
New York (1)	Saratoga County, NY (1)	Tunbridge (1)	Ludlow (1)
		Cabot (1)	Killington (1)
Anyplace with digital data/scanned surveys (2)		Montpelier (1)	Manchester (1)
Town clerk portal (2)		Marshfield (1)	Huntington (1)

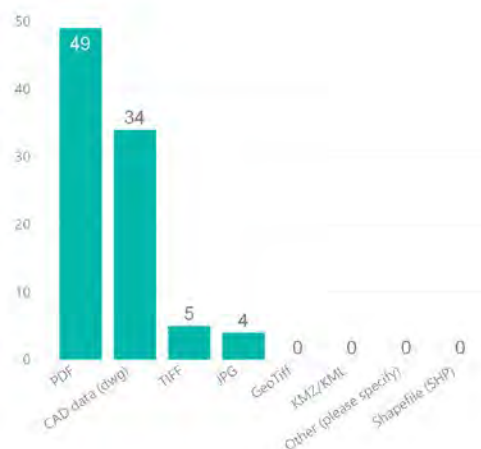
Q6: If the State of Vermont was to create a digital repository for surveys, what should be included? (Select all that apply)



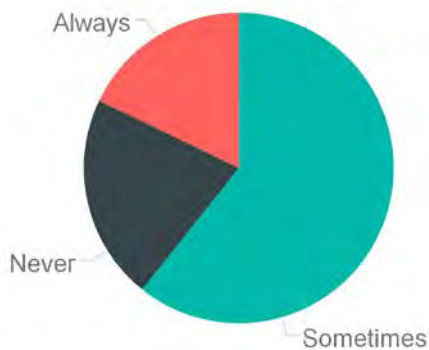
Q7: Do you currently create digital versions of your surveys?



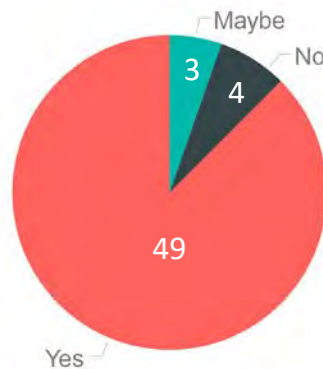
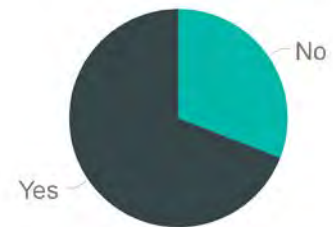
Q8: If yes, what format (check all that apply)?



Q9: Do you currently include Vermont State Plane Coordinates on your surveys?



Q10: Do you have the ability to georeference digital surveys?



Q11: Would you support a state law requiring surveys for any subdivision or boundary line adjustment in Vermont?

Q12: Do you have any other thoughts, ideas, or concerns regarding the creation of a central survey repository?

- | | |
|--|---|
| “extremely helpful” | “better do this before older generations and their records disappear” |
| “excellent idea” | |
| “good idea, long overdue” | “the MA system works great” |
| “some towns won’t allow us to copy maps anymore or can’t make full size copies of surveys” | “should be publicly accessible and free to use” |
| | “I would pay \$2-5 per survey” |
| “needs hold harmless clause to protect surveyors who donate their surveys” | “it’s not a matter of ‘if’, but ‘when’, we serve the public at large” |
| “VT seems to be very behind on this” | “most of my clients choose not to have their surveys recorded and I would need to respect that” |
| “all should be georeferenced, even if just indexed that way” | |
| “will make research easier and more efficient” | “I do not see the need for a central survey repository” |

Digital Survey Legislative Advisory Group

August 23, 2018

2:00 – 4:00 pm

Justin Morrill Conference Room

6th Floor National Life Building

- 2:00 Introductions
- 2:05 Background Information & Updates
 - Parcel Program / Parcel Advisory Board
 - Survey of Surveyors
 - Digital Survey Repository
 -
- 2:20 Digital Surveys: Legislative Goals and Process
- 2:30 Discussion: Components & Contents of Legislation
 - a. Digital Plat Submission Requirements
 - b. Survey Repository
 - c. Survey Requirement for Subdivision and Boundary Line Adjustment
 - d. Other?
- 3:45 Wrap-Up and Next Steps

Participants

Adams, John E. (Meeting Organizer)
vermontlandsurveyor@comcast.net Paul Hannan
Cloutier, Ryan (Accepted in Outlook)
Randall Otis (Accepted in Outlook)
Terway, Tim (Accepted in Outlook)
Fox, David N (Accepted in Outlook)
Azaria, Dale (Accepted in Outlook)

At the request of the Statewide Parcel Advisory Board, the Vermont Society of Land Surveyors Executive Committee selected three Licensed Surveyors (Paul Hannan, Ryan Cloutier, Randall Otis) to serve as an advisory group to the Board tasked with making specific recommendations regarding legislation that would create a digital repository of surveys that could be used to help maintain statewide parcel data. The recommendations provided are compatible with the current practice of Surveying in Vermont and are not expected to add costs to municipalities, surveyors, or their clients.

Summary of Recommendations:

- 1) Require a digital copy of new surveys recorded in the land records to be submitted to a central repository.
 - Digital copies of any survey should be accepted in the repository, however only those recorded in the land records should be required to be submitted. Some land owners do want to share surveys and they should maintain right to keep them private.
 - The signed mylar with raised seal is the official survey, digital copies are for reference purposes.
 - Surveyors, as opposed to Town Clerks or property owners, should be the individuals submitting digital copies to the repository. This minimizes the number of people that need to be familiar with the process to a small group of professionals. Note: the trigger determining when digital copies of new surveys should be submitted is TBD.

- Relevant section of statute: 27 VSA § 1401. Acceptance of survey plats; definition.

2) Specify basic digital copy format/standard (PDF) and give Board of Land Surveying authority to revise/create updated digital survey standard.

- The most common and universal file type used by surveyors in the Portable Document Format (PDF). While it is desirable for the Statewide Parcel Program to have the surveys georeferenced & include state plane coordinates, the group suggests having the digital survey standard as basic as possible and allowing for the Board of Land Surveying to modify over time as necessary.
- Digital copies should not need to include signatures. PDFs exported directly from surveying software will be of greater quality than any scanned documents.
- Relevant section of statute: 27 VSA § 1403. Composition of survey plats

3) Specify that only new property lines (subdivisions/boundary line adjustments) are required to be surveyed and recorded, as opposed to entire parcels.

- While most licensed surveyors support requiring surveys for boundary line adjustments and subdivisions, it was recognized by the group that requiring surveys of entire parcels when only part of the parcel is altered/subdivided that there could be increased costs for property owners with large properties.
- It was noted that surveyors would have an inherent interest in any regulation that would increase business for surveyors and it was suggested that the Land Surveyors Society may want to avoid taking a position on any such proposal to avoid the appearance of any conflict of interest.
- Relevant section of statute: 27 VSA § 341. Conveyance Of Real Estate (Requirements generally; recording)

Notes

John Adams opened meeting with introductions, gave background on parcel program. Goal is to have state-wide parcel data available by the end of 2019, this data should be up to date, and easily accessible. The goal of this legislation is to support the long-term maintenance of the parcel data.

Survey of Surveyors on 10/2017: 56 respondents out of approximately 100 practicing surveyors. Generally high levels of support for a digital repository. New Hampshire was considered a good example. PDFs are most common digital survey format. State Plane Coordinates are placed on surveys most of time. Strong support for state law requiring surveys.

Paul: Identifying adjoining information for Surveys is currently challenging. Parcel data is opportunity to serve as helpful index.

Discussion Topics:

Digital Plat Submission requirements.

Review of 27 V.S.A. § 1401 'Filing of Land Plats'

The VSLS supports some form of digital survey requirement, the group discussed when it should / should not be required.

Paul: Some land owners don't want to share surveys. What about handshake land exchanges-does this constitute a "sub-division"? Existing loophole, should not be able use meets and bounds without referencing actual survey that's recorded. Anything recorded in clerk's office should be digitized. Notes on survey that only signed mylar with raised seal is official survey. More than 1/2 of work is not related to subdivision or boundary lines, unknown how many of those are eventually get recorded. Needs to be in statue that you can't transfer land by reference to tax parcel numbers – need to reference survey.

Randy: Clients can decided not to record for a variety of reasons, surveys can be sealed at clerk's office. While many Town's digitizing, need to mindful of municipal resources – probably can't rely on Towns to scan. Nice to know what slide or page the survey will be recorded on associated with the digital submission. Puts notes on PDFs provide to town clerks that they are not originals.

Ryan: Other surveys to increase accuracy of lines, parcels serve to connect to other information. Maine has a family division ordinance, surprised that Vermont does not. Should look to other states for examples. How to police who records. What if whoever records survey has to submit a PDF.

The group discussed challenges in figuring out an ideal workflow that's convenient for everybody.

Dale: 3 choices for who records: Client, Surveyor, or Clerk. Clients too diverse, do clerks have the capacity? fewer surveyors. What's the trigger?

General agreement Surveyors are the appropriate individuals to submit digital surveys to repository. Still unclear what the right trigger would be and whether municipalities would want to be involved. It would be nice to have information about where originals are in the town records.

Survey Content and Format

Coordinates required? Few magnetic surveys being done. Barrier to entry for survey grade equipment is low. Requiring coordinates is likely to have some push back from a couple of people in the surveying community, although most would include them already. Some surveyors would volunteer extra data like CAD files or maybe even shapefiles. What is the required format for surveys? Don't be too detailed in requirements in Legislation. Preference is for PDF or best available. Allow Legislative Committee on Administrative Rules as recommended by Board of Land Surveyors.

Would digital requirement increase cost of surveys? Consensus is no. Should help lower cost as digital repository makes it easier to research records.

When should Survey's be required?

While many state's require surveys to transfer properties, it was thought that this would encounter resistance and not currently the right solution for Vermont. Requiring surveys only for subdivisions or boundary lines adjustments seems reasonable and currently practiced in most places. Question about large lots and proverbial farmer carving off a small lot - could add cost that otherwise might not currently exist. Could be addressed by limiting requirement new only property line(s). There was some discussion about how one would survey only 'one line', but this was more a question for the professional practice, not legislation as this is existing issue. Most towns already require surveys and its rare not to survey in the event of transfer / subdivision. Ryan thinks it's the exception. 80% of towns have a requirement. 20% no land use regulation at all. Paul suggests that Land Surveyors Society avoid taking a position on requiring surveys as there could be perceived conflict of interest.

Take away:

Anything recorded in land records should go into the repository.

What is the trigger, how to associate with slide number? TBD

Survey repository details to be discussed further.

Survey requirement:

Only survey new lines not full property.

A PDF or Board Standard

Next Steps:

VCGI to send summary to participants.

For existing statutes relevant to proposals herein for long-term parcel maintenance, see the following:

[19 V.S.A. § 44](#) regarding the establishment of the Statewide Property Parcel Mapping Program

[15 V.S.A. § 1152](#) regarding the Address Confidentiality Program, a.k.a. the Safe at Home Act

[27 V.S.A. § 1401](#) regarding Acceptance of survey plats

[27 V.S.A. § 1403](#) regarding Composition of survey plats

[27 V.S.A. § 341](#) regarding Requirements generally (Conveyance of Real Estate)

[32 V.S.A. § 4041\(a\)](#) regarding Reappraisal (Grand Tax Lists)

Existing statutes and examples of possible amendment considerations:

Title 27: Property

Chapter 017: Filing of Land Plats

§1401. Acceptance of survey plats; definition

(a) Each town clerk shall accept survey plats for filing and maintain files and indices to files of survey plats in accordance with this chapter.

(b) For purposes of this chapter, “survey plat” shall mean a map or plan drawn to scale of one or more parcels, tracts or subdivisions of land, showing, but not limited to, boundaries, corners, markers, monuments, easements, and other rights. (Added 1969, No. 235 (Adj. Sess.), § 3; amended 1991, No. 163 (Adj. Sess.), § 1.)

Possible Amendment Considerations:

- *(c) A digital copy of plats filed in accordance with this chapter shall be submitted by the surveyor to the Vermont Center for Geographic Information at the time of the creation of a mylar for public recording. The Center shall maintain digital plat copies in a statewide digital repository and make them available to the public.*
- *(d) Plats filed with the town clerk remain the official version.*

Title 27: Property

Chapter 017: Filing of Land Plats

§1403. Composition of survey plats

(a) Plats filed in accordance with this chapter shall be on sheets 11 inches by 17 inches or 18 inches by 24 inches in size or 24 inches by 36 inches if the town or city has appropriate storage facilities as determined by the town or city clerk.

(b) Plats filed in accordance with this chapter shall also conform with the following requirements:

(1) Each survey plat shall contain an inset locus map clearly indicating the location of the land depicted and a legend of symbols used.

(2) All lettering and data shall be clearly legible.

(3) Plat scale ratios shall be sufficient to allow all pertinent survey data to be shown, and each plat shall contain a graphic scale graduated in units of measure used in the body of the plat.

(4) Each plat sheet shall have a minimum one-half inch margin, except the binder side, which shall have a minimum one and one-half inch margin.

(5) Each plat sheet shall contain a title area in the lower right-hand corner of the sheet stating the location of the land, scale expressed in engineering units, date of compilation, the name of the record owner as of that date, the land surveyor's certification as outlined in 26 V.S.A. § 2596, and a certification that the plat conforms with requirements of this section. These certifications shall be accompanied by the responsible land surveyor's seal, name and number, and signature.

(6) Each survey plat shall contain a graphical indication of the reference meridian used on the survey plat and a statement describing the basis of bearings referenced on the survey plat.

(7) When the plat sheet is produced by a reproduction process, the process shall be identified and certified to by the producer in the margin of the plat sheet. Original plat sheets shall be so identified and certified to by the same process.

(8) The recordable plat materials shall be composed in one of the following processes:

- (A) fixed-line photographic process on stable base polyester film; or
- (B) pigment ink on stable base polyester film or linen tracing cloth.

(c) Survey plats prepared and dated before July 1, 1992 shall be exempt from the requirements of subdivisions (b)(1)-(6) and (8) of this section, but shall comply with requirements in State law in effect when the plats were prepared and dated.

(d) Survey plats prepared and dated before any statutory regulation of land plats shall comply with subsection (a) and subdivision (b)(7) of this section.

(e) Any survey plat exempted by subsection (c) or (d) of this section and revised after July 1, 1992 shall meet all the requirements of this chapter. (Added 1969, No. 235 (Adj. Sess.), § 3; amended 1991, No. 163 (Adj. Sess.), § 1; 1993, No. 62, §§ 1-3; 1995, No. 148 (Adj. Sess.), § 4(c)(2), eff. May 6, 1996; 2009, No. 91 (Adj. Sess.), § 13, eff. May 6, 2010; 2011, No. 155 (Adj. Sess.), § 17; 2011, No. 155 (Adj. Sess.), § 18, eff. July 1, 2013; 2015, No. 156 (Adj. Sess.), § 18.)

Possible Amendment Considerations:

- *(b)(9) Digital copies of plats filed in accordance with this chapter to a survey repository maintained by the Vermont Center for Geographic Information (VCGI) outlined in 27 V.S.A. § 1401 shall be in portable document format (PDF).*
- *(b)(10) The Board of Land Surveyors, in consultation with VCGI, has the authority to create and revise a digital survey standard for digital copies of plats.*

Title 27: Property

Chapter 005: Conveyance of Real Estate

§ 341. Requirements generally; recording [effective July 1, 2019]

(a) Deeds and other conveyances of lands, or of an estate or interest therein, shall be signed by the party granting the same and acknowledged by the grantor before a notary public and recorded at length in the clerk's office of the town in which such lands lie. Such acknowledgment before a notary public shall be valid without an official stamp being affixed to his or her signature.

(b) A deed or other conveyance of land that includes a reference to a survey prepared or revised after July 1, 1988 may be recorded only if it is accompanied by the survey to which it refers, or cites the volume and page in the land records showing where the survey has previously been recorded.

(c) A lease of real property that has a term of more than one year from the making of the lease need not be recorded at length if a notice or memorandum of lease, which is executed and acknowledged as provided in subsection (a) of this section, is recorded in the land records of the town in which the leased property is situated. The notice of lease shall contain at least the following information:

- (1) the names of the parties to the lease as set forth in the lease;
- (2) a statement of the rights of a party to extend or renew the lease;
- (3) any addresses set forth in the lease as those of the parties;
- (4) the date of the execution of the lease;
- (5) the term of the lease, the date of commencement, and the date of termination;
- (6) a description of the real property as set forth in the lease;
- (7) a statement of the rights of a party to purchase the real property or exercise a right of first refusal with respect thereto;
- (8) a statement of any restrictions on assignment of the lease; and
- (9) the location of an original lease. (Amended 1967, No. 231 (Adj. Sess.), § 1, eff. Jan. 24, 1968; 1973, No. 249 (Adj. Sess.), § 84, eff. April 9, 1974; 1987, No. 220 (Adj. Sess.); 1993, No. 174 (Adj. Sess.), § 1; 1997, No. 86 (Adj. Sess.), § 1; 2003, No. 150 (Adj. Sess.), § 5; 2017, No. 24, § 3, eff. May 4, 2017; 2017, No. 28, § 5, eff. May 10, 2017; 2017, No. 160 (Adj. Sess.), § 2, eff. July 1, 2019.)

Possible Amendment Considerations:

- *(b)(1) If the conveyance of land results in the subdivision of a parcel, or a change in parcel boundary locations, the deed shall be accompanied by a survey plat that depicts the new parcel boundaries to which it refers, or cites the volume and page in the land records showing where a survey depicting the new parcel boundaries has previously been recorded.*

