

Maine Integrated Land Records Information System

**The Maine Library of Geographic Information
Federal Geographic Data Committee**



An Integrated Land Records Information System For the State of Maine

Conceptual Framework | Functional Specification
Promotional Plan | Research Findings

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A Maine Integrated Land Records System

Since April, 2008 the GeoLibrary has been gathering information to assist Maine in designing a GIS-based integrated land records information system (ILRIS) which would provide access to information about all property parcels and their context within adjoining lands. This effort has in part been funded by a \$50,000 grant by The Federal Geographic Data Committee ("FGDC") which promotes the coordinated development and dissemination of national geospatial data. The grant monies were obtained from the FGDC's Fifty States Initiative and have been supplemented by contributions from the Geolibary and Maine Office of Geographic Information Systems (MEGIS).

This project was scoped and delivered as four independent documents. Each was designed to inform the overall ILRIS process in a focused way while complementing the others to provide a complete and accurate a picture of current needs and future objectives.

These four primary components are presented here in largely the same format as that which they took as they were used during their specific phases of the project. As such, some of the introductory material that allowed each to perform as a stand-alone document, such as sectional overviews and tables of contents, has been retained. This will permit them to be more easily excerpted, subdivided and used in anticipated public engagements as this project evolves.

The four sections include:

Section 1: Conceptual Framework

Providing the high level, generally accepted vision of a proposed integrated land records information system. The purpose of this section is to compile and formalize findings from the research phase into a set of goals that are realistically attainable and will promote the enhanced integration of Maine land records and improve access to property ownership and rights data in the state. The Conceptual Framework can be considered the Executive Summary and narrative overview of the Integrated Land Records project.

Section 2: Functional Specification

Providing a more detailed itemization of specific and actionable items that expand the Conceptual Framework and focus attention toward areas where future activities may be funded and completed contractually. This section utilizes a more terse format of bullets and outlining to extend the framework concepts

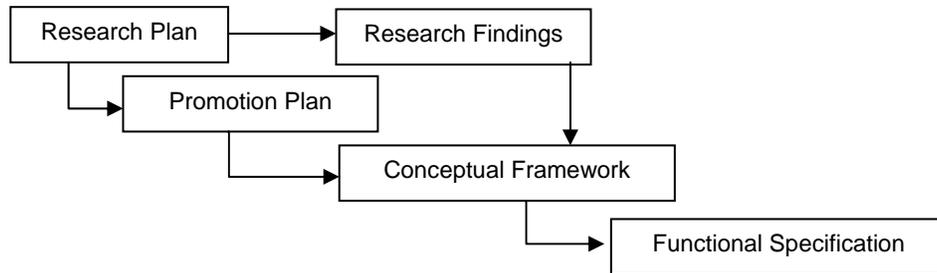
Section 3: Promotional Plan

Describing approaches to advertise, champion, educate and advance the Maine ILRIS system during both this study as well as into the future as the ILRIS initiative evolves.

Section 4: Research Plan and Findings

Describing the research activities and substantive findings produced during the initial stages of the ILRIS study. The first of the document set to be produced, the Research section guided overall information-gathering and reported content produced during numerous public forums and individual interviews.

Each section contains a version of the following context map which clarifies how that particular document fits into the larger initiative.



In addition to the four primary report sections, a number of supporting materials are included for reference. These include:

Appendix A: Glossary of Terms

Appendix B: Project Contacts List

Appendix C: Municipal Parcel Status Inventory. Also available as a live document at:

http://www.editgrid.com/user/rs1618/ME_ILRIS_ParcelStatus

Appendix D: ILRIS Promotional Sheet

http://www.maine.gov/geolib/integrated_land_records.pdf

An **ILRIS project weblog** has been maintained and will continue to be maintained at:

<http://maineplan.blogspot.com/>

And ongoing developments regarding this initiative may be tracked at the official Maine GeoLibrary site:

<http://www.maine.gov/geolib/>

Maine GeoLibrary Board
Integrated Land Records Information System

Section 1:
CONCEPTUAL FRAMEWORK

July 2009

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1-1. INTRODUCTION

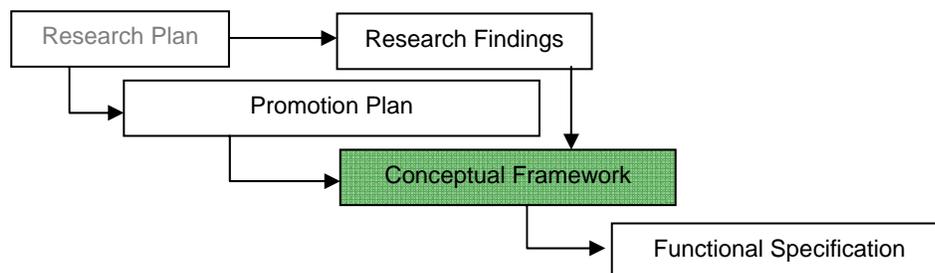
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The Maine ILRIS would build upon and enhance the accessibility and utility of geographic information now maintained by data stewards at all levels of Maine government. Once implemented the ILRIS would allow all persons interested in the attributes of a particular parcel (among them, title examiners, planners, conservationists, and developers) to see a parcel on an aerial photograph (map quality orthoimagery is the desired standard), and readily access information about land cover, roads, protected lands, soils, wetlands, aquifers, geology and other pertinent geography. Under the envisioned ILRIS this information would also be linked with parcel title information maintained in the county deed registries. The current GeoLibrary project is a first step in determining how best to create these links.

This Conceptual Framework document provides a high level summary and overview for a proposed integrated land records system. Its purpose is to compile and formalize findings from extensive research into an overall set of goals that are realistically attainable and will promote the enhanced integration of Maine land records and improve access to property ownership and rights data in the state.

The Conceptual Framework for the Maine Integrated Land Records Information System has been developed as the result of input from multiple forums, meetings and discussions with geographic data users and potential stakeholders from all levels of government and the private sector both within and outside of Maine. It is a subcomponent of a structured set of deliverables, including Research, Promotion and ultimately a Functional Specification that will be used to assign roles and costs to facilitate attainment of project objectives.

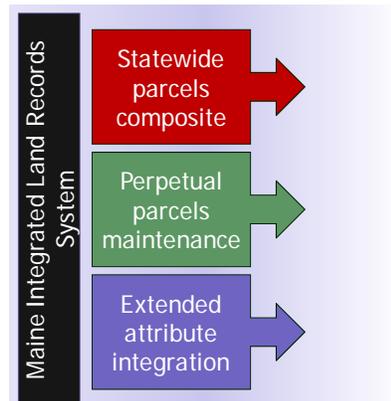
Document Context:



1-2. CONCEPTUAL CORE

The Maine GeoLibrary seeks to develop a system of unified property records across the state. The basic principles of this initiative can be summarized in a three key assumptions about what a final system should include and about how these records should be aggregated and maintained. These include:

- Creation of a statewide parcel composite
- Development of a perpetual maintenance system and network to ensure these records are kept current
- Adding value to these data through technical association of individual records with other data sources through extended attributes sets.



These three components would provide Maine with all of the critical data upon which to integrate and grow a coordinated land records system. They would also serve to build and maintain a cohesive network of data stewards compiling data at the most local levels and rolling it up to higher jurisdictions for use all the way to the federal level.

The **parcels composite** would include geometry and basic identifying descriptors of every individually documented property in the state. This would include digital property parcels in the form traditionally used for display and query in geographic information systems. The quality of the geometry and integrity of attached attribute data would be dictated by existing or extended Maine GeoLibrary parcel standard requirements.

Perpetual parcels maintenance would be instituted to ensure that these data remain accurate and current through time. Even if all of Maine's more than 750,000 property parcels could be delivered as an exhaustive composite immediately, without a working maintenance regime in place their accuracy would be compromised with the first boundary change or subdivision. Rigorous data updating will ultimately require legislation to keep the many functional contributors actively participating and complying with the overall framework.

Widespread system utility and added value will be realized by **integrating secondary data** sources through shared attributes as well as geographic relationships. This is the functional goal which offers the greatest potential benefits to the greatest number of current and prospective GIS stakeholders. A mature integrated land records system will allow users to ask such questions as "where are all of the properties with shore frontage?" or "what is the current set of parcels in foreclosure?" or "show me all land in Maine's Tree Growth program" and return accurate graphical as well as quantified tabular data with defensible answers.

The secondary sources, such as great ponds polygons, foreclosure filings or Tree Growth certifications, will only be accessible for map-based analysis once a parcels framework is available to integrate them into.

In pursuit of these core goals, a number of enabling tasks need to be undertaken to move the process forward incrementally. Anticipated tasks include:

- Refinement and enforcement of existing data standards
- Maintenance of an exhaustive inventory of data providers, including contacts, data characterization and distribution and access details.
- Coordination of participating stakeholders
- Pilot production of completed data

1-3. STATEWIDE PARCELS COMPOSITE

Creation of Statewide Uniform Parcel Coverage

The central pillar of a Maine Integrated Land Records System will be an exhaustive boundary to boundary digital parcels layer for the state. To satisfy the needs of an effective ILRIS, this data layer must:

- Satisfy the basic **needs of local assessing and planning** entities; it must provide basic capabilities to address the most frequently posited queries; these are the 20% of questions asked 80% of the time (20/80)
- Provide genuine **utility for regional and state planning purposes**
- Provide uniform attributes as well as geometry for every property in the state
- **Conform with federal and state standards** as a cadastral framework layer

Geometry Components

Allowable geometric tolerances of parcel features are well documented in the existing Maine Parcel Standard¹ as adopted in January, 2005. These components include projection, line work, coincident features and automation tolerances and address scale and accuracy considerations appropriate for local as well as regional scale analysis.

If statewide data automation is to proceed smoothly, close adherence to some aspects of the geometry standard will be critical. Management of edge-matching between municipalities is of particular concern. Inconsistencies between adjoining towns' parcels are inevitable and in some cases quite pronounced. ILRIS must provide tools to help adjust and reconcile these boundary inconsistencies and facilitate efforts to resolve them.

A provision exists in the existing standard for coding such parcels as "in dispute." Because of existing and anticipated inconsistencies, all boundary polygons should be coded and tracked with care in anticipation of future initiatives geared specifically toward addressing this issue.

It may also be advisable to establish grant conditions stipulating that parcels are digitized over the most accurate and current available base orthoimagery. While this may seem obvious, the prevalence and accessibility of numerous image layers of different ages and provenances makes using dated versions an easy error to make. The GeoLibrary can provide guidance here, and the evolving GeoPortal is opening up access to a wide array of base imagery to most GIS editing environments.

Attribute Components

In order for automation and maintenance to be practicable, the ILRIS will need a basic, uniform attribute set. Again, the basis for this will be the existing Parcel Standard requirements. Most of the vital data components are already accounted for in this standard to facilitate optimal indexing and connection to associated data resources.

The Standard currently stipulates the following attribute fields (data attached directly to the geometric features) as the core requirement:

¹ State of Maine Standards for Digital Parcel Files is available online from <http://megis.maine.gov/standards/>

- STATE_ID: A unique, statewide identifier for each parcel. The township geocode constitutes the first five numbers of the identifier followed by a unique, sequential number generated by software for each parcel in the township. (numeric field)
- MAP_BK_LOT: A municipal designation field which carries the map, block and lot assigned to each parcel by the municipal assessor. This field is the link to the municipal databases. It may not be possible to make this link between the assessor's database and the digital parcel map for every parcel or property record – a one to one relationship. This standard requires only an initial effort to make the linkage as complete as possible. (character field)
- PARENT: The map_bk_lot listing in the assessor's database where information about a parcel may be found. Some Maine towns organize their tax assessing database so that only one bill is sent to each property owner. If the property owner holds several lots only one listing in the assessor's database will be made to serve for all of them. In these cases one map-block-lot designation will be assigned to the combined listing. For the remaining lots, the parent field contains a pointer to the appropriate map-block-plot listing.
- PROP_LOC: The physical address of the property, if applicable. (character field)

A significant number of additional data fields (19) are identified in the Standard as required . These are keyed to the primary fields through the STATE_ID and MAP_BK_LOT identifiers. These are fully referenced in the Functional Specification document.

A core attribute set is essential to ensure that parcel features can be keyed into the maximum number of tabular data sources based on shared attribute information. Of special note in this regard are the MAP_BK_LOT attributes, which key to municipal data, and the LS_BOOK and LS_PAGE fields, used to tie the data into County Registry data.

In addition to the fields listed above, the following would provide significant utility to a functional and forward looking integrated system:

- Maine ILRIS key: providing a unique identifier for any parcel in time; this would eliminate confusion associated with parcels renamed or renumbered by towns or forced into duplicate naming by parcels cuts and combines. Possible components of an ILRIS key have been identified to include:
 - Server-generated identifier, assigned and validated against current existing list; this would need an operational owner, probably at the Office of Information Technology (OIT) but Maine Revenue Services (MRS) is a possibility as well.
 - Municipally-generated identifier, assigned and validated according to rules established by state standard – area code and phone number --
 - Assignment of this number should occur during the Real Estate Transfer Tax process;

Feature Storage and Distribution

In addition to the distributed repositories where parcel data is stored and used to serve local needs, a standards-compliant extract would be periodically inserted into a Central Parcels Directory. This centralized repository would serve as the main point of standardization as well as distribution hub for property parcel data and its key attribute set.²

In an efficiently implemented system, a single repository could provide storage, editing and distribution capabilities for the entire state. No meaningful data storage or management impediments exist to operating a multi-million record system, and substantial economies of scale could be realized by

² Parcel data for currently available subset of Maine (parcel grant) municipalities are distributed with metadata by MeGIS at <http://megis.maine.gov/catalog/catalog.asp?state=2&extent=town#parcels>

eliminating the need for a large quantity of expensive, distributed software (hundreds of licenses) along with the technical expertise necessary to maintain and operate it. The functional framework for this deployment scheme is currently coalescing in the state's geodata portal.

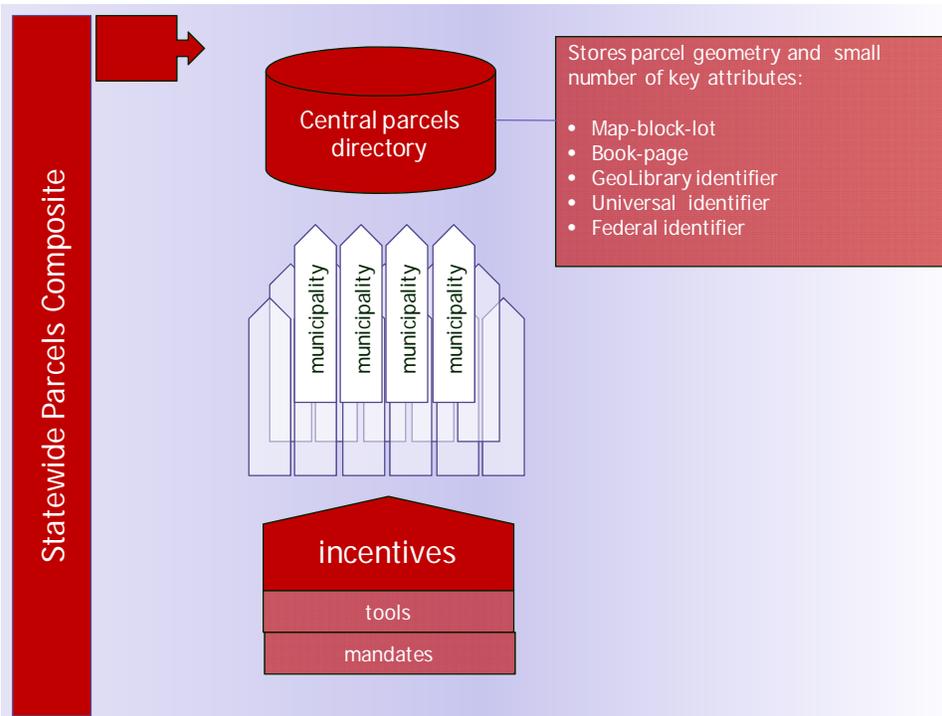


Figure 2: A central directory of parcels is necessary for effective administration as well as distribution of data. Uniform geometry should be maintained with a minimal set of attributes, primarily to be used as keys to other data sources.

Of course there are many benefits to keeping the mechanics of local, on-the-ground expertise and geographic data quality review and assurance in close proximity to one another. But the physical data do not need to be warehoused locally for this to operate most effectively. It is far more important that the data be carefully input and validated according to agreed upon standards than to support professionals with high level technical expertise in every town and city in Maine.

Strategies for Attaining Uniform Statewide Parcels

Accurate digital mapping of each parcel in the state presents considerable technical and organizational challenges. Though the raw number of overall parcels (<800,000) represents fewer than those comprising many individual counties in the U.S., the organizational impediments posed by the sheer number of maintaining entities are formidable: there are potentially hundreds of potential points of failure in a working Maine ILRIS.

Three possible paths have been identified as practical options for attaining a full statewide map down of digital parcel data. These include

- an incremental approach similar to what has been used in the previous rounds of parcel grants;
- a bundled automation approach, where groups of municipalities are tactically automated in unison, and

- a statewide blitz initiative, where the entire state is completed over an accelerated timeline. Descriptions of these follow.

Incremental development through individual municipal grants

The most obvious approach to mapping down property parcels for Maine is to use the tried and tested mechanisms that have worked in previous rounds of state parcel grants. These grants have resulted in compliance of more than 20% of Maine communities with a standard, digital format.

The earlier parcel grant rounds were not funded or designed to develop new content, however. The consequence of this is that much of the low hanging fruit has been harvested, and a large percentage of the remaining parcels will need to be automated beginning from a much rougher starting point.

Funding development of such data presents the state with a much more complicated task, and future funding rounds would need to be massively augmented to supply sufficient resources to achieving statewide completion in this fashion.

Bundled automation of locally or demographically/developmentally similar cohort towns

Opportunities exist to regionalize similar towns by geography or shared characteristics and undertake collective mapping for these municipalities in bulk. Ideally this would be an incentive-based undertaking, where towns could be provided with standardized “80/20” tools once their parcels were automated. Such tools would likely initially serve assessing and planning needs.

Statewide blitz initiative

The quickest and most time-efficient approach would be to gather up current assessing maps and assessing attributes from all of the presently non-automated municipalities and exhaustively digitize these using consistent quality controls. This would require the largest mobilization of staff and resources, but economies of scale would make it the most cost-effective approach overall.

It is unlikely that such an approach could be undertaken without some form of statewide enabling legislation. This is due to the historical, deeply ingrained home-rule mentality prevalent in many Maine municipalities and the widely held perception that modernized land records management and geospatial capabilities do not offer sufficient potential value to justify changing business practices.

In some cases such as very small towns there is practical truth to this; when managing a jurisdiction with fewer than 1,000 parcels, it is difficult to justify the technical cost and transition burden associated with implementing a GIS. But from the regional and state perspective, any boundary-to-boundary system requires participation by all jurisdictions. Thus, in municipalities where bottom-up participation can not be counted on, ILRIS would need to be implemented from the top down. Still, even if all automation and maintenance costs were borne by the state, municipal participation would remain vital to ensure timely and accurate contributions to the perpetual maintenance data chain.

Recent activities at the federal level are increasing the likelihood that resources may be made available to support a more aggressive approach as part of stimulus funding, homeland security, mortgage tracking or accelerated development of a national cadastre. In light of these developments it is important that implementation planning for this approach should be well considered should such federal funding be made available.

1-4. PERPETUAL PARCELS MAINTENANCE

Perpetual Parcel Maintenance Mechanism in Advance of Statewide Coverage

Ongoing parcels editing and checking-in must be instituted to ensure all data in the repository remain accurate and current through time. The most persistent criticism of the more than seventy towns' data presently available via MEGIS download is that they are not up-to-date and there is no mechanism in place to make them so.

Many applications using digital property data rely on accurate representations of recent changes. In order to ensure that any comprehensive system provide maximum utility, it is therefore essential that the incremental changes occurring on the ground be reflected in the data repository as quickly and accurately as possible.

In the interest of achieving this dynamic level of maintenance, there is a compelling case to made that day-forward digitizing and cataloging of incremental changes to existing parcel standard municipalities should be instituted *before* statewide parcel data are pursued as an objective. Such a system would eliminate the possibility of data immediately going stale following delivery of town-wide mapping.

A significant number of municipalities with digital parcels do not update these records actively (annually or less frequently). For this reason it would be favorable to enable perpetual maintenance capabilities without imposing the burden exclusively on the towns. Properly implementing such a maintenance scheme would provide a profound benefit to many geospatially underserved communities.

Perpetual maintenance could be facilitated in the following sequence:

1. Property owner subdivides a parcel
2. New deeds are generated
3. New ILRIS ID is created (using authentication server/service)
4. Deed language is conveyed to the municipality through RETT form transmittal
5. Municipality digitizes new parcel change according to deed language, survey or plan using local system

OR

- 5a. Municipality digitizes new parcel change using central or regional system
- 5b. Municipality conveys manuscripts to contractor who performs changes and checks these into central system.

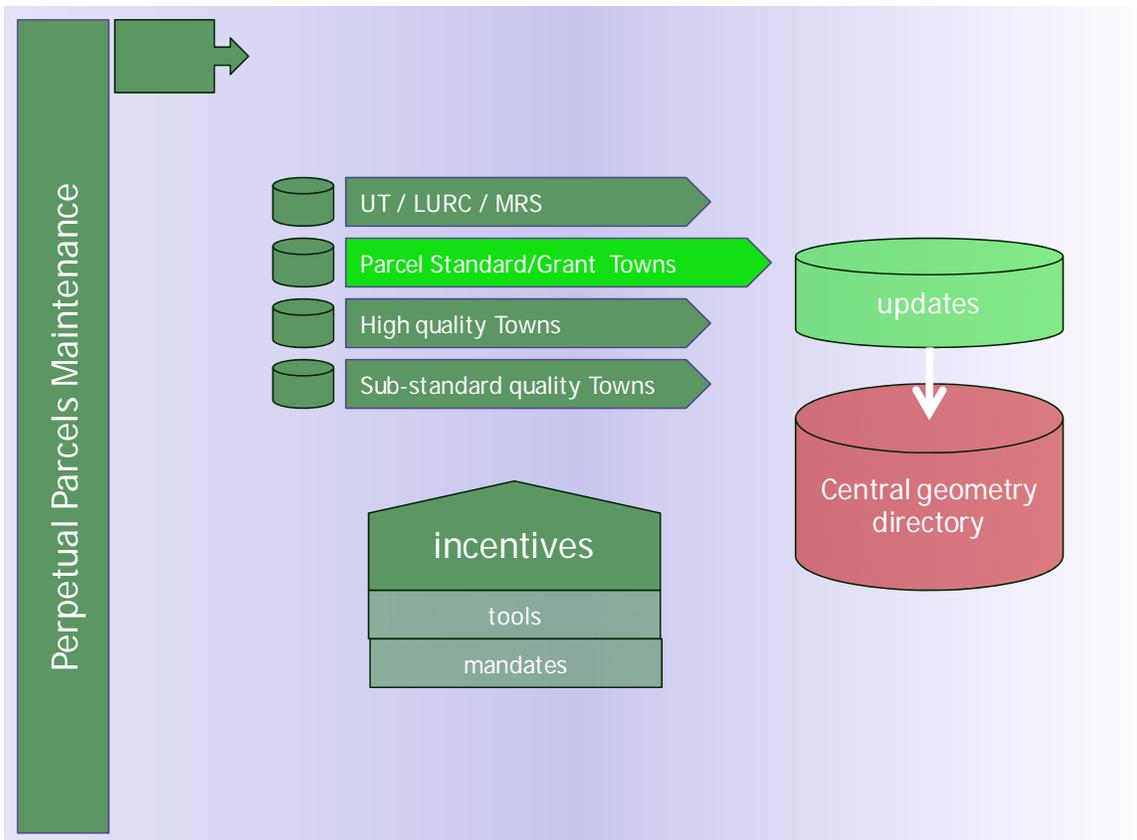


Figure 3: Perpetual maintenance should begin with a program that ensures existing parcel grant municipalities' data is current (annual update minimum) and is provides this update increment to the statewide Central Geometry Directory

Strategic Principles for Perpetual Parcel Maintenance

- Expansion of parcel coverage should proceed from existing parcel grant towns
- Ongoing digital parcel maintenance should be assured or subsidized for every municipality meeting the standard
- It makes sense to withhold additional parcel development grant funding from municipalities without a committed and established maintenance regime until an overall statewide strategy is secure

1-5. INTEGRATING OTHER LAND RECORDS DATABASES

Integrate Content from County Registries and other Sources

With the overall parcel geometry and maintenance in place, the benefits of integrated land records can begin to accrue. At this stage the parcel data are ready to be married with other data resources both through tabular attributes (such as information stored about property in Assessor's databases) as well as through spatial relationships (using proximity analysis tools).

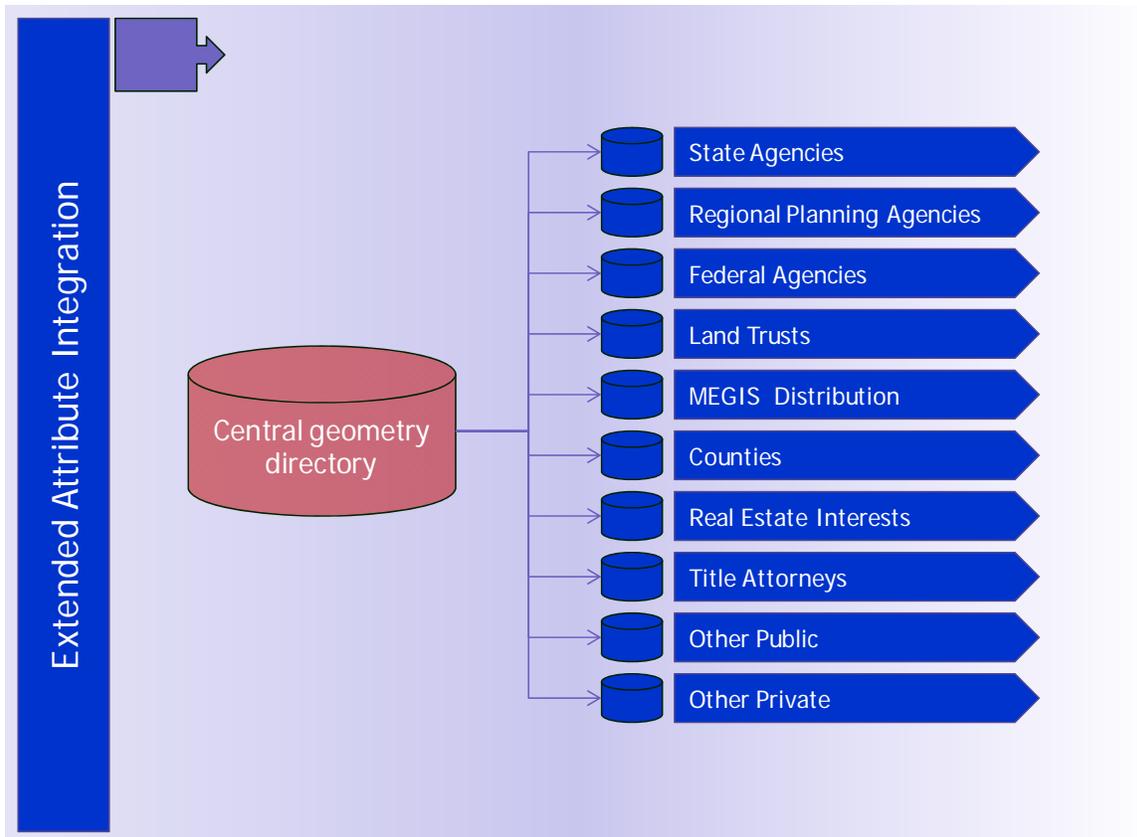


Figure 4: The Central Geometry Directory would serve as the repository-of-record for relating parcel geometry to the tabular records of a large number of secondary data providers. A subset of these is shown, though the full list would be considerably larger

Tabular content integration at the county level would directly involve the 18 County Registries. Interactive data maintenance and access relationships must exist between current GIS data resources (including municipal parcel records and MEGIS holdings) and County deeds, surveys and other documents. Identified approaches for developing these relationships and data conduits include:

- Initiation of a program to georeference scanned survey plans and distribute through web-based map services; this will serve to place existing registered surveys accurately in real world geography and make them available for use as a reference grid to “survey truth” digital parcel line work
- Geocode (add x,y pair) to the metadata set associated with individual book and page reference documents and develop application programming interfaces to access these resources using geographic queries
- Institute a uniform property identifier (ILRIS ID) to provide a unique identifier across counties and throughout the state

1-6. CONCLUSIONS

Integrated Land Records, marrying digital tax parcel maps with information from municipalities, counties and state agencies, are an indispensable tool for modern governance.

Over the past twenty five years geographic information systems (GIS) have been used to enable these tools, primarily at the local level in larger cities. And the Maine GeoLibrary has taken impressive initial strides toward integrating these systems more cohesively through targeted grants and planning efforts over the past ten years.

But the overall coverage in the state remains spotty and inconsistent. Maintenance of the data that do exist is not uniform or dependable, and hundreds of towns around the state have no access to the technology and its benefits.

Digital parcel mapping is the only practical means to exhaustively inventory property records, locally, regionally or statewide. The intelligent map that this technology provides may be queried, symbolized, shared and refined to provide a common operating picture for all potential users of property records data.

And there are many. Not just property assessors or appraisers, but analysts, regulators and enforcement officers in environmental agencies, transportation, health and economic development.

What properties have shorefront access? Where is the land in the Tree Growth program? Where is the real estate in foreclosure or in pre-foreclosure status? How many private parcels abut or are in visual range of wind farms? How many individual properties lie over a particular wetland or deer yard? Where are all of the properties that have sold or split in the past year?

All of these questions can be answered with simple queries against a property database. None of these questions can be answered here now.

In Maine, where land plays such a vital role in local livelihoods and sense of place, the tools should be available to address and answer these and countless other questions vital to the state and local interests.

Maine GeoLibrary Board
Integrated Land Records Information System

Section 2:
FUNCTIONAL SPECIFICATION

July 2009

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2-1. INTRODUCTION

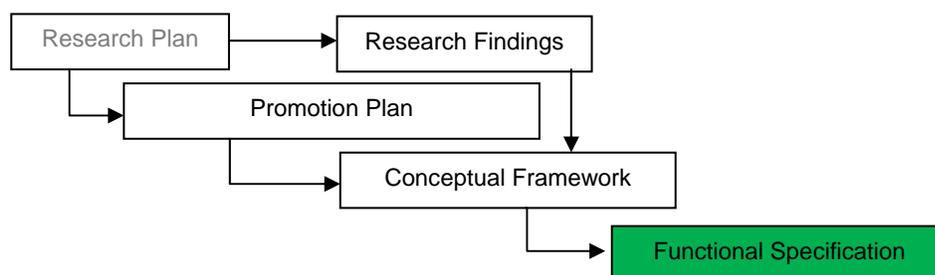
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This document provides a Functional Specification for the ILRIS. Its purpose is to elaborate on findings from the Conceptual Framework and convert these into actionable items that may be funded and completed contractually.

The Functional Specification for the Maine Integrated Land Records Information System is a subcomponent of a structured set of deliverables, preceded by Research, Promotion and a Conceptual Framework documents.

Document Context:



2-2. OVERVIEW

A functioning ILRIS represents a substantial organizational commitment and significant time, personnel and funding. It is a long view, multi-year undertaking that should be implemented in a scalable, sustainable fashion that will permit it to provide the basis for real property records display and query throughout the state. The core objectives of the ILRIS initiative are:

- Creation of a complete and uniform parcel coverage

- Perpetual maintenance of geometry and primary attributes
- Integration of content from secondary sources

This specification document addresses specific issues which must be addressed to move Maine toward an overall integrated property information system in the context of these three primary objectives.

Each of the three components is addressed in **Scope** and **Funding** sections.

2-3. UNIFORM PARCEL COVERAGE COMPLETION

Scope

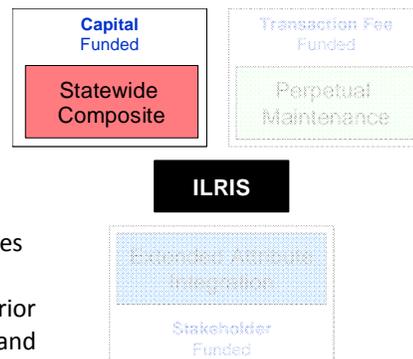
The primary objective of a Maine Integrated Land Records System is “boundary-to-boundary” coverage of all of the state’s property parcels to a consistent level of accuracy with matched edges and attributes.

- To complete statewide mapping of Maine digital parcels requires automation or adjustment of approximately 600,000 features/parcels. In raw numbers this amounts to 4 times the number of parcels captured during the two previous GeoLibrary grant rounds.
- The nature of this effort will be more labor intensive than previous parcel grants, as many of the source materials are not currently in digital vector format; therefore per parcel cost will be higher than during the previous grant rounds.
- Municipal participation is essential. Municipal assessing and other land-focused departments are traditionally the primary beneficiaries of digital parcel data, and any regional or statewide system will not be possible without their consent and input.
- Municipalities may be incentivized to participate; the GeoLibrary could facilitate participation through administration of standard products and services. These would be largely provided by the private sector but overseen and subsidized through the GeoLibrary. Potential services offering high utility are anticipated to include:
 - Assessing map book generation service
 - May be provided at no cost for initial year(s) by GeoLibrary
 - Would offer uniform format and layout for all towns
 - Provides a subscription-based service in subsequent years
 - Implementation would be facilitated by private contractors
 - Could be streamlined with integration of local printing and reprographics service providers
 - Standard templates could be extended by GeoLibrary-approved vendors
 - Online data display and query viewers
 - Could provide a standard functionality set
 - Query by property attributes
 - View parcel in context on map
 - Print map
 - Application Programming Interface available to provide developer access independent of standard viewer
 - Standard viewer: provides uniform format and layout
 - General public access to geometry and core attributes

- Tiered/authenticated access to extended attributes
 - Owner information
 - Core parcel-driven utilities:
 - Abutters list generation / proximity analysis
 - Streamlined access to Registry data (deeds and plans) via LS_BOOK, LS_PAGE links
- “Opt out” should be minimized:
 - The stated aim of ILRIS is to provide complete property parcel coverage throughout the state. Ideally 100% inclusion could be achieved using incentives, without the need of compulsory, legislated requirements for participation. This may be unrealistic, considering Maine’s strong tradition of home rule and the large number of small jurisdictions that will need to be included to provided an exhaustive data set
 - Exclusion of sensitive data in primary data (owner information) will be helpful in this regard
- State of Maine (Maine Revenue Services, Property Tax Division) could enhance reporting standards to prefer or require map-based inventories of municipal properties
 - Counts and status for properties conforming to “classified lands” status
 - Tree Growth
 - Farmland
 - Open Space
 - Working waterfront
 - Fully funds initial automation but requires municipalities to cover costs of ongoing maintenance
- GeoLibrary could pre-approve/pre-qualify vendors for automation of parcels to state standard
 - Fast-tracks digitizing and delivery
 - Allows existing vendors to service current municipal clients
 - Favors service providers in existing relationships

Funding – Statewide Parcels Composite

- Automation of approximately 600,000 parcels if undertaken in an aggressive, coordinated capture effort will likely cost between \$3.50 and \$4.50 per parcel, conservatively representing a \$2.5 million initiative.
- This level of funding will not be made available from municipal sources.
- Potential identified funding sources are state bond monies or federal matching funds
- Potential target federal agencies are Department of Interior (DOI) including US Geological Survey (USGS) and FGDC; and Department of Homeland Security (DHS)
- Funding should be administered through GeoLibrary grants
- Award and administration of grants will occur consistent with previous grant round funding, though tighter control of source documents will be required since many municipal GIS layers will need to be compiled from municipal assessing atlases



Pilot

- Completing one or more counties in order to control processes and variables is advisable. The working candidate area for initial implementation of complete parcels coverage is a four county area extending from Canada to the coast. This pilot strip would include Augusta, significant UT area, urban centers and the watershed of one of Maine's largest rivers. Kennebec would serve as the initial automation and county-level integration area. Total parcel counts for all four counties are below 150,000. The included counties and towns along with approximate parcel counts are listed below.

Kennebec County (66,000 parcels)

Albion	Clinton	Manchester	Readfield	Wayne
Augusta	Farmingdale	Monmouth	Rome	West Gardiner
Belgrade	Fayette	Mt Vernon	Sidney	Windsor
Benton	Gardiner	Oakland	Vassalboro	Winslow
Chelsea	Hallowell	Pittston	Vienna	Winthrop
China	Litchfield	Randolph	Waterville	

Lincoln County (28,000 parcels)

Alna	Bristol	Jefferson	Somerville	Westport
Boothbay	Damariscotta	Monhegan Island	South Bristol	Whitefield
Boothbay Hbr	Dresden	Newcastle	Southport	Wiscasset
Bremen	Edgecomb	Nobelboro	Waldoboro	

Sagadahoc County (19,000 parcels)

Arrowsic	Bowdoin	Georgetown	Richmond	West Bath
Bath	Bowdoinham	Phippsburg	Topsham	Woolwich

Somerset County (36,000 parcels)

Anson	Harmony	Palmyra	Fairfield	Canaan
Athens	Hartland	Pleasant Rdg (p)	Madison	Cornville
Bingham	Highland Pltn	Ripley	Mercer	Detroit
Brighton (p)	Jackman	St Albans	Norridgewock	Pittsfield
Cambridge	Moose River	Starks	Smithfield	Skowhegan
Caratunk	Moscow	The Forks (p)	Solon	
Dennistown (p)	New Portland	West Forks (p)		
Embden	North Anson			

2-4. PERPETUAL MAINTENANCE

Scope

Perpetual parcels maintenance must be instituted to ensure that this data resource remains accurate and current through time.

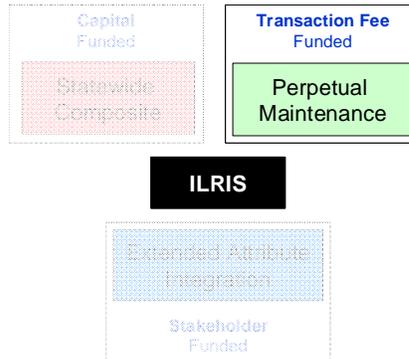
- The ILRIS project team feels it may be preferable to initiate maintenance relationships with all current GeoLibrary standard municipalities prior to attempt an overall statewide composite. This will ensure future content in GeoLibrary is up to date
 - Iteration frequency may vary between municipalities
 - A fully perpetual system will maintain current accuracy with the county-municipal-state Real Estate Transfer Tax cycle, ensuring that all jurisdictions are calling properties by common identifiers
 - Property owner subdivides parcel
 - New deeds are created
 - New ILRIS ID is generated (using state authentication server)
 - Deed language is conveyed to municipality
 - Municipality digitizes new parcel change according to deed language, survey or plan using local system or vendor proxy, or central browser-based system
 - Data should be kept current for web-based query through the state’s “layer of record”
 - A distributable digital layer of record should only be updated annually for full download
- Digital parcel data in the state is presently maintained either by technically qualified municipal GIS officials or through agents in the commercial or non-profit sector. While a number of the commercial and non-profit agents maintain data for multiple communities, all parcels edits are made on an individual town basis¹. Large benefits through economies of scale and technical concentration will occur if a mechanism is developed by which many of the smaller communities in the state can contract in a uniform way through pre-approved vendors conforming to GeoLibrary standards.
- An ILRIS unique ID generation/authentication server should be implemented to ensure that data integrity is maintained within and across municipalities
 - OIT or MRS located and managed
 - Ensures unique IDs across state
- County Registry ID keys (LastSale_Book, LastSale_Page) must be enforced as a populated field value in the standardized parcel data set.

Funding

- Grants should be made available to incentivize subscription into perpetual maintenance program. Some likely options:
 - State will fund ongoing parcel geometry maintenance if municipalities maintain, populate and scrub attributes to meet all GeoLibrary standards
 - Especially key fields:
 - ILRIS ID
 - Registry keys (LS_Book, LS_Page)
 - Physical address
 - Map/Block/Lot
 - Multi-year (3,5,10?) commitments would need to be made by towns in order to qualify for subsidy

¹ The Unorganized Territory under the administration of LURC provides a bundled service where parcel data for hundreds of townships (28,000 parcels/10m acres) is maintained through a single office at Maine Revenue Services in Augusta.

- Any municipality would be encouraged to maintain parcels internally to state standard or to contract maintenance out to qualified private vendors



2-5. EXTENDING INTEGRATION OF ASSOCIATED CONTENT

Scope

In addition to the core content from municipalities and key fields necessary for links to town and county registry data, a wide array of additional sources (both tabular and geospatial) should be used to attach to the parcels core to add analytical value. Some of these, along with strategies for integration, are itemized here:

- Registered survey plan reference layer development
 - Useful to geometrically correct areas of parcel cadastral fabric through overlay and corrective alignment
 - Provided by county registries
 - Would need to be georeferenced to a GeoLibrary-approved geographic coordinate system
 - Plans could be bundled by date and/or area and put out to bid to contractors for georeferencing
 - Integration of scanned surveys will serve as a preliminary exercise in anticipation of delivery of digital plan files
 - Maine GeoLibrary could become steward and broker/distributor of all digital plan files (scanned raster and vector)
 - Automation funded by GeoLibrary, contracts administered by MeGIS
- Seed grants/contracts could be issued for developing “disposition by parcel” metrics
 - Landuse types
 - Augmented/populated by towns but partially harvestable from overlays with groundcover rasters
 - May be assembled from enforced population of LAND_USE code
 - Currently 165,000 of 204,000 have NO LAND_USE values in grant municipality data
 - Water access
 - Invasive weed notifications
 - Eutrophication remediation
 - Municipal boundary abutters
 - Useful for potential boundary surveying and re-monumentation efforts
 - Potential windfall for surveyors

- PROP_LOC: The physical address of the property, if applicable. (character field)

A significant number of additional fields of data are identified in the Standard as required (19). These are keyed to the primary fields through the STATE_ID and MAP_BK_LOT identifiers. They are:

- OWNER: Name of first owner of record (character field)
 - **NOTE: most municipalities have two owners and two addresses – the ILRIS project team advises adding secondary ownership table space or splitting all ownership information into an independent table.**
- OWN_ADDR: Owner’s address (character field)
- OWN_CITY: Owner’s city or town. (character field)
- OWN_STATE: Owner’s state if not Maine (character field)
- OWN_ZIP: Owner’s zip code, plus four if available. (character field)
- OWN_CNTRY: Owner’s country if not U.S.A. (character field)
- LAND_VAL: The current total assessed value for land (numeric field)
- BLDG_VAL: The current total assessed value for building(s) (numeric field)
- FY: Date of assessed value (date field) -
 - **MODIFICATION NOTE: value should be captured as TY (tax year); or TY should be maintained as an independent field**
- LOT_SIZE: The assessed area (numeric field, allowing for up to two decimal places)
- SIZE_UNITS: The area units (character field; “S” for square feet and “A” for acres)
- LS_DATE: Last sale date (date field)
- LS_PRICE: Last sale price (numeric field)
- LAND_USE: State land use code (numeric field)
- LS_BOOK: Last sale Registry of Deeds book (character field)
- LS_PAGE: Last sale Registry of Deeds page (character field)
- LIV_UNITS: Number of dwelling units, apartments and condominiums, if available (numeric field)
- BLDG_SIZE: Building area (square feet) for commercial/industrial properties as defined by the state use codes.(numeric field)
- POLY_TYPE: A field to explain polygons in the file that are not legal interests (character field; valid values are RAIL ROW = railroad right-of-way, TRAFFIC ISLE = traffic islands in street right-of-way, WATER = ponds/rivers, ISLE = island in pond or river, and OTHER

Additionally, a small number of fields is included in the standard to add value and quality to the data. These are:

- YEAR_CREATED: The date a lot was created by split or subdivision (numeric field)
- SOURCE: Boundary feature source (character field; valid values are DEED, SUBDIVISION, ROAD PLAN, SURVEY, OTHER).
- PLAN_ID: Identifying information for plan (example: subdivision or road plan) used to update the digital file (character field).
- UPD_DATE: The date of update to the property boundary. Should include the year and month of the update (character field).
- RES_AREA: Total residential living area in square feet. This is a useful attribute when evaluating development proposals relative to surrounding residences, but a difficult one to create because it requires adding areas from multiple fields in the assessor’s database (numeric field).
- CI_AREA: Total building area for commercial/industrial properties in square feet. This is a very useful attribute for evaluating proposed and existing development, but it is difficult to create because it requires adding areas from multiple fields in the assessor’s database (numeric field).

A core attribute set is essential to ensure that parcel features can be keyed into the maximum number of tabular data sources based on shared attribute information. Of special note in this regard are the

MAP_BK_LOT attributes, which are used to key to municipal data, and the LS_BOOK and LS_PAGE fields, used to tie the data into County Registry data.

In addition to the fields listed above, the following would provide significant utility to a functional and forward looking integrated system:

- Physical property address: providing the basis for a master address list for the state; in many cases not coincident with the mailing address. In Maine when a physical address is created by the town addressing officer the same address is used for mailing and 9-1-1. However, a large parcel can span many addresses and even a small parcel can have multiple addresses (trailer park, condo complex, etc.). That said, for the majority of the number of parcels a physical address would be one-to-one and a useful piece of information
- Maine ILRIS key: providing a unique identifier for any parcel in time; this would eliminate confusion associated with parcels renamed or renumbered by towns or forced into duplicate naming by parcels cuts and combines. Possible components of an ILRIS key have been identified to include:
 - April 1 watershed date for digital “wholesale” distribution, data updates
 - After April 1 a parcel split is digitized and is published to the map in distinctive symbology (red-lined) and enters the database as “provisional”; the stated assumption regarding such features is that they are in progress and subject to change
 - GeoLibrary distributes provisional and certified data versions
 - Technically enabled municipalities perform updates at their own rates (to geometry and attributes)
 - Tax commitment is only done annually
 - With digital RETT, MRS will have transfers the day the registry approves them
 - Server-generated identifiers, assigned and validated against current existing list (possibly OIT or MRS – probably not MRS, but it *must be owned by a single entity*)

2-7. ENABLING TASKS

In support of the three core Integrated Land Records project Goals, a primary set of tasks will serve to advance the initiative.

Task A: Enhance and Enforce Data and Process Standards

The existing Maine Parcel Standard provides a vital foundation upon which data consistency depends and future coordination and integration will rely.

Additional standards may need to be established and formally recognized in order to more thoroughly integrate land records. These may include:

- Survey plan digital submission standards
- County Registry document x,y pair format and tolerance standards
- Easement and Right of Way recording standards
- Town boundary and monumentation standards

Task B: Build and Maintain Definitive Digital Parcel Status Inventory

Status of parcel data throughout the state must be actively monitored to provide information necessary to track and administer a comprehensive system. The GeoLibrary either itself or through an agent should provide an interface and portal that serves as a one-stop-shop for information about land records data in Maine. This information clearinghouse would

- Provide at least basic access and status information for every municipality in the state
- Integrate with MRS Statistical Summary and MEGIS inventories
- Offer opportunities for crowdsourcing (content collection using voluntary input from large numbers of users) and wiki-collaboration, by encouraging and incentivizing contribution of content by individual municipalities
- Implement county-wide or multi-county-wide pilot as proof of concept
- Fund maintenance through MRS, GeoLibrary, and federal sources

Task C: Provide Statewide Land Records Data Coordination

The complexity and dynamism of integrating land records data at the state level will ultimately require the attention of a full time equivalent staff member to maintain coordination and interface with stakeholders. Staffing such a position should be explored as a vital component of the Maine land records infrastructure.

- The Land Records Data Coordinator roles must be clearly articulated. Responsibilities and duties will include
 - Stitching together municipal-county-state (Assessor-Registry-Revenue Services) relationships
 - Actively explore and exploit federal funding and interface with DOI geospatial framework initiatives
 - Actively explore non-traditional funding opportunities

Maine GeoLibrary Board
Integrated Land Records Information System

Section 3:
PROMOTION PLAN

July 2009

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3-1. INTRODUCTION

The Maine Library of Geographic Information (“Geolibrary”) has been working with the Maine Office of Information Technology and the Maine Office of Geographic Information Systems (“MEGIS”) to help the State develop geographic information system (“GIS”) capabilities to promote efficient government administration and land use planning. Since April, 2008 the GeoLibrary has been gathering information to assist Maine in designing a GIS-based integrated land records information system (“ILRIS”) which would facilitate access to information about a particular parcel and adjoining lands. This effort has in part been funded by a \$50,000 grant by The Federal Geographic Data Committee (“FGDC”) which promotes the coordinated development and dissemination of national geospatial data. The grant monies were obtained from the FGDC’s Fifty States Initiative and have been supplemented by contributions from the Geolibrary and MEGIS¹.

The Maine ILRIS would build upon and enhance the accessibility and utility of geographic information now maintained by data stewards at all levels of Maine government. Once implemented the ILRIS would allow all persons interested in the attributes of a particular parcel (among them, title examiners, planners, conservationists, and developers) to see a parcel on an aerial photograph (map quality orthoimagery is the desired standard), and readily access information about land cover, roads, protected lands, soils, wetlands, aquifers, geology and other pertinent geography. Under the envisioned ILRIS this information would also be linked with parcel title information maintained in the county deed registries. The current GeoLibrary project is a first step in determining how best to create these links.

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This framework document describes the promotion plan for a Maine Integrated Land Records Information System (ILRIS). It provides information regarding activities undertaken to date as well as proposed actions designed to advertise and encourage digital land records development and evolution in Maine.

3-2. OVERVIEW + BACKGROUND

¹ (<http://www.fgdc.gov/policyandplanning/50states>)

Although considerable land parcel data resources exist in Maine, these are not nearly all in digital form, are not in a common format, and are not consistently available across the state.

The pillars of Maine’s integrated land records future include statewide digital parcel coverage, perpetual maintenance of these data and integration of other geospatial data resources with this foundation layer.

The primary objective of integrating land records regionally, statewide and across maintenance jurisdictions is to achieve greater efficiencies in collection and stewardship while improving quality of service and access to users at all levels of government and in the private sector.

Active promotion and advertisement of any land records initiative in Maine will be essential if it is to achieve the support and funding necessary to become self sustaining.

Integrating land records into a unified system is a long view undertaking; deeded records of surface land ownership constitute some of the oldest continuous document preservation and management operations in America. While the accelerated evolution of information technology has eliminated most technical impediments, a great deal of organizational complexity and many political stumbling blocks remain. The ILRIS study seeks to help address these in a considered and careful way that will provide a logical path toward the future.

Involving key data-contributing constituencies is vital. The two primary sources of land records data are municipal assessors and county registers. Others, such as Maine Revenue Service, LURC, title researchers and attorneys, commercial real estate information providers, land surveyors and map maintainers, state agencies, federal data users and others also need to be engaged to successfully advance project adoption and success.

Accurate and dependable land records data represents a potentially valuable asset for a large group of users. It is relatively easy to generate interest in users and prospective users through examples of working applications and data integrated with new technologies. But no truly meaningful advances in land records efficiency and integration in Maine will occur without active participation by the primary data providers.

Additionally, there are hazards to advertising applications too far in advance of their functional availability, as this introduces user impatience and frustration if the applications do not materialize quickly enough.

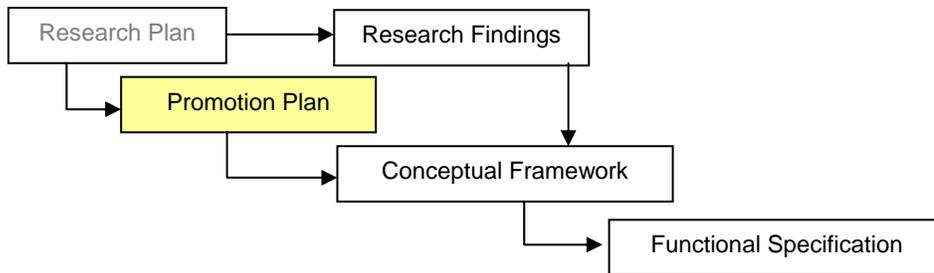
Geographically enabling and exposing dependable and current surface land ownership data will almost certainly spawn commercially viable applications. However, it will be premature to elaborate these too specifically without establishing underlying data sources and integration strategies.

When the data production and supply chain have been formalized, tool development specific to user needs will become a practical reality and promotion can be targeted to specific use cases and audiences.

To this end, key targets for promotion of land records initiatives must be identified, and strategies and tactics for promoting land records reform to these targets must be developed.

3-3. DOCUMENT CONTEXT

The following flow graphic describes this document in the context of overall Integrated Land Records Information System deliverables and milestones.



3-4. GENERAL PROMOTIONAL CONSIDERATIONS

During the research and reconnaissance phase of this study, some core principles of potential ILRIS project promotion have come into focus. These include:

- The three defined pillars of a Maine ILRIS have been identified as:
 - Development of a boundary to boundary statewide parcels composite
 - Creation of a system of ensured and perpetual maintenance of digital parcels data
 - Fostering and encouragement of integration of additional data sources to augment and extend the “intelligence” of digital parcels
- Promotion of land records integration should pay special consideration to current land records data providers, many of whom are not familiar with details and benefits of GIS.
- Both of the above stakeholder types will require easily accessed and comprehensive demonstrations of benefits;
- Potential workflow changes must not be seen as a threat to existing revenue sources, or as a technical or labor intensive imposition on already strained staff; promotion of activities that violate this consideration will be counter-productive;
- Data vendors and technical facilitators should be part of ongoing discussions and promotional activities to avoid unnecessary frictions resulting from process change and revenue shifts;
- Any identified system improvements must be tailored to business needs specific to individual constituencies;
- Because land records integration will occur incrementally over an extended time line, promotion and advancement of integrated land records in Maine should persist as an ongoing focus of the Maine GeoLibrary;
- Some of the potential advocates and beneficiaries are those least familiar with the technology. These include legislators, other elected local officials, and professionals such as lawyers who have traditionally had little exposure to the technology
- Effective, long range, statewide integrated land records integration will almost certainly require the existence of a digital land records coordinator; such serve as the technical liaison between the GeoLibrary and different data stakeholders, as well as the primary promotional advocate;

This report divides the overall ILRIS user base into multiple categories. These include Tier 1 (data producers), Tier 2 (data consumers), and Tier 3 (technical facilitators and vendors).

3-5. TIER 1 – LAND DATA PROVIDER CANDIDATES + STRATEGIES

While there are many potential users and beneficiaries of consolidated land records across the State, project outreach and information gathering to date has confirmed that land records improvement and integration will happen only if the needs of land records data contributors and stewards are considered first. To foster interest and involvement among these providers, tangible, practical benefits will need to be apparent.

Tier 1 data providers consist of

- Municipalities (primarily tax assessing professionals)
- Counties (primarily deeds registers)
- Maine Revenue Services (primarily Property Tax Division)

Municipal Promotion

Land records use at the municipal level is parcel-centric and typically gets its start serving the needs and activities of assessing staff. The requirements of taxation have historically provided the best business-driven motivation for keeping these property data accurate and current.

Property parcels, for highest accuracy, will always need to be maintained and monitored by local authorities. Even if technical edits are made by contracted commercial vendors, cut and combine parcel operations always must be validated and approved by municipal officials.

It is always to a municipality's benefit to build a secure data foundation of and around a carefully constructed and maintained digital parcels layer. Many municipalities recognize this, yet haven't embarked on this development path due to resource or technical constraints.

For very small, rural towns and townships, implementing digital parcel management will always present a resource challenge. If Maine adopts the objective of border-to-border digital parcel coverage, bringing these smaller municipalities into the conformance and collaboration will necessarily require some manner of subsidized or free services and products.

Numerous municipal parcel data success stories exist throughout the state, but many towns without parcel data will not be able to build their own systems from scratch.

Data and services built on top of Maine's existing parcel standards can provide a self-promoting path to more universal parcel coverage.

Promoting land records use at the municipal level will likely have its greatest initial and persisting success serving assessing operations. Some possible tools that might be introduced into technologically underdeveloped municipalities include:

- An introductory parcel features and tabular data viewer that allows municipal officials to compare these two data products and provide the "first scrub" that only digital data provide;
- A general purpose, web-based parcel display + query tool. This would be an effective means to familiarize assessors (and others) with benefits of geospatial technology for property data management. General delivery techniques and technologies are well established in this area and many communities around the state use them to meet ongoing business requirements;
- A parcel abutters notification tool. Numerous planning and development activities require or benefit by notification of abutting property owners to a target parcel. This tool is a standard of municipal and county GIS implementations around the country for good reason. If one tool were

- available for all standards-compliant content this would provide useful functionality that many individual towns will not fund independently;
- MEGIS/GeoLibrary hosted applications that identify Deeds Registry data from a map and automatically route the user to the appropriate online checkout for purchasing and downloading these data. Such applications could include capabilities for cost and revenue sharing between the data providers, technical facilitators, and the GeoLibrary.

Such tools could be beneficial at the town level while providing powerful promotional leverage for adoption by other towns. Effective promotion through municipal parcel tools would depend on centralized distribution of these applications by the Maine GeoLibrary or a proxy.

Once the parcel-based ownership fabric is established a large number of additional applications and data extensions could be erected on this foundation with relative ease. Special use overlays such as easements, right of ways and zoning are inevitable successors to a parcels base. Building footprints, edge of pavement and transportation layers, utilities and others can easily piggyback on accurate and dependable land parcel data.

Technology Transfer

Even if all Maine property parcels were currently digitized and available for distribution, an effective system of technology transfer would be necessary to promote best use and upkeep. Dozens of Maine municipalities currently utilize digital parcel data in a wide array of business processes and there are growing pockets of expertise where modern and adequately funded systems serve as models for smaller systems that are not yet as fully evolved. This presently occurs in an ad hoc patchwork, and lessons taught and learned in one region can be quite different than those being transferred elsewhere.

Similar to the way benefits accrue through standardized data, standardized services can be provided through centralized or distributed providers if foundational data are available to build upon. Application developers need to be able to depend on data formats and availability. In a context where these are established and enforced by the GeoLibrary, code and expertise will be more portable from town to town and region to region.

Program promotion through this type of technology transfer can prove extremely effective. A digital records coordinator would maintain a current understanding of the staff and capabilities of high-functioning implementations and help cultivate relationships with regionally or demographically similar and receptive lower-functioning municipalities. The same mentoring relationship could be developed among many classes of data consumers, but the municipal cases are especially important due to the status of municipalities as data producers.

To some extent all workshops, forums, seminars, meetings and instances of information exchange constitute technology transfer. But effective program promotion would be achieved through formalizing some of these relationships and creating a culture of readily available support from proven implementers throughout the state.

Promotion & Benefits

What can municipalities expect to get in return for exposing local data and participating in an integrated program, and who are the individuals and organizations who will be the most suitable sponsors and promoters of the activities that provide these benefits? The following table provides an initial attempt to identify some benefits and promotional strategies appropriate to pursuing them.

Municipal Benefit	Promotional Strategy	Promoter/Enabler/Sponsor
Accurate and transparent assessing	"Quick and dirty" automation of parcel basemap; Develop and distribute tools for data clean up for town officials to use;	Towns with technology transfer from regional excellence centers; guidance from GeoLibrary standards
Abutter notifications and alerts	Develop standard tool and advertise its use and effectiveness; promote the use of more rigorous notification procedures;	GeoLibrary through vendors and public/private technical facilitators;
Master address file development	Advertise to multiple municipal departments	GeoLibrary + MeGIS with E911 and DOT involvement;
Tree Growth Program Inventories	Assist towns in itemizing properties participating in Tree Growth program	State Planning Office in conjunction with GeoLibrary
Planning: Economic Development Prospecting	Provide guidelines to towns and regional organizations to identify and prioritize lands for development;	SPO: GeoLibrary; Department of Economic and Community Development
Planning: Brownfields Redevelopment	Work with towns to identify and prioritize undesirable lands for subsidized demolition/reconstruction	EPA; SPO; GeoLibrary; DECD; DEP
Fostering interdepartment communication	Hold workshops highlighting benefits of state, regional and local geographic data and applications;	MeGIS; GeoLibrary; commercial vendors
Fostering inter-municipal data sharing, planning and communication	Hold workshops describing how parcels can be used in conjunction with other layers to provide more informed/enlightened area planning	MeGIS; GeoLibrary, SPO, Regional Planning Agencies;

Initial Promotional Candidates

A list of high probability initial municipal data contributors to an integrated land records system follows below. These entities are qualified by their participation in GeoLibrary funded parcel grants or by their interest as demonstrated through participation in this ongoing project. The towns and cities in these lists would provide a logical place to begin deployment of bundled applications of the types identified above.

Parcel Grants: Round 1		
Anson	Freeport	Raymond
Auburn	Harrison	Rockport
Bath	Gorham	Rumford
Biddeford	Gray	Skowhegan
Bridgton	Islesboro	South Portland
Brooksville	Jackson	Stonington
Cape Elizabeth	Kittery	Sweden
Casco	Madawaska	Thorndike
Castle Hill	Mapleton	Unity
Chapman	Mariaville	Woodstock
Cumberland	New Gloucester	Verona
Denmark	North Yarmouth	Woodland
Ellsworth	Norway	Yarmouth
Falmouth	Oxford	
Fort Kent	Paris	

Parcel Grants: Round 2		
Arrowsic	Levant	Standish
Bethel	Lovell	Topsham
Bowdoin	Lyman	Turner
Bowdoinham	Phippsburg	Vassalboro
China	Ogunquit	Waldoboro
Clifton	Readfield	West Bath
Dover-Focxroft	Richmond	Winslow
Friendship	Saco	Whiting
Hermon	Searsmont	
Lincoln	South Berwick	

Land Records Study Participants		
Bar Harbor	Lisbon	St George
Belgrade	Long Island	Windham
Brewer	Old Orchard Beach	
Holden	Poland	
Lewiston		

Parcel grant towns vary in size and are distributed throughout the state, but the simple fact that their data is uniformly attributed and therefore could easily be bundled into applications makes these municipalities very attractive as ILRIS pilot towns or regions.

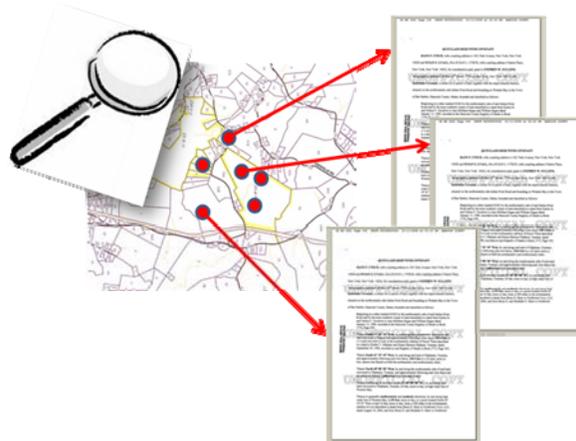
For town-specific promotional activities to be most effectively launched, towns and cities could be classed together by size and encouraged to pursue new technologies.

There are also potential opportunities for larger towns and cities to share their successes and best practices with smaller, untested towns.

County Promotion

Land records use at the county level are chiefly indexed by party in interest, although some map indexing is geographic. County registry of deeds archives are document-centric, focused on deeds, surveys, mortgages, easements, leases, liens and other reference materials vital for conveying and determining claims to properties. With 18 total registries in the state the number of contact points and data providers is small enough to allow for standard setting and collaboration of the group as a whole.

The great value counties bring to the land records mix is conveyance data associated with properties. Deeds, which describe property boundaries, and surveys, which accurately define limits of ownership through metes and bounds, are the basis of stable Maine land ownership claims.



Due to of the historical separation of county and municipal record keeping however, these data have only a very feeble relationship to the tax records maintained at the municipal level.

Many users would like to bring these two data sources together in order to more easily research ownership in support of land transactions. Surveys also provide a potentially valuable asset as certified reference points that can be used to anchor digital parcel data and other layers.

Maine county registries currently provide data access on site as well as through operational online systems. These web-based interfaces provide access to documents and charge per transaction fees for viewing and downloading documents.

In its simplest form, an integrated land records system that included county documents would make these documents searchable by geography. That is, a user could draw a shape on a map, or identify a parcel or group of parcels and request Registry documents geographically linked to those areas.

Promoting Integration to Counties

Intuitively it seems like requests of this sort should be easy to fulfill, but the nature and history of deed and survey indexing and storage has never provided the information to facilitate this link. The ILRIS project team has therefore looked extensively at the most suitable approaches for integrating these critical data with parcels and other geographic assets.

The key question: What can counties expect to receive for participating in a more integrated system? Some of possibilities include:

- Better, more accurate and more specific querying of registry assets
- Higher revenue through higher volume provided through better data access and interface
- Higher profile presence and GIS utility as regional service centers for GIS with basic geospatially enabled document integration.

This final item holds significant interest for some counties, and would provide a valuable first line of access to GIS for a population that historically has had very little to do with this technology.

A scenario can be imagined where one or more GIS mapping workstations are co-located within a registry and contain tools which allow users to superimpose survey and deed information on standard MeGIS layers. Such tools would provide users with hands on, immediately pertinent interaction with geospatial data and, in addition to providing valuable context to otherwise detached deed information, and could introduce open a large number of Maine data consumers to the information inherent in GIS.

Because spatial data analysis has never been the function of Registers of Deeds (despite the land-centric nature of the huge quantity of resources in their repositories) some simple promotional activities might help to make the utility of these data relationships more complete. Examples of these might include:

- Providing parcel data (relevant to respective counties) in immediately useable format. Such packages could include town parcel composites or subsets in Google Earth KML format to permit immediate viewing and querying in a no cost and highly intuitive software environment.
- Convening registers and/or other county staff regularly to learn about new and existing technologies and transfer technology amongst themselves.
- Because the number of counties is relatively small, a statewide Digital Land Records coordinator would be able to maintain close communication with most or all deeds registers.
- Since the data transaction and supply chain between counties, towns and the Maine Revenue Service, Property Tax Division has been a frequent source of time lags in data processing and sharing, promotional opportunities exist to build relationships and advance integration

Counties and their most advanced municipal parcel implementers should be encouraged to meet regularly and work at developing integrated data applications.

Additionally, online Registry document access vendors should be included in discussions about what steps may be taken to open up more data, at reasonable prices, for different and larger classes of users.

MRS + LURC Promotion

Because the Maine Land Use Regulation Commission and Maine Revenue Services, Property Tax Divisions, act as land records administrators for the huge Unorganized Territory, their participation in any integrated system is essential. MRS/LURC maintains a working integrated land records system that in some senses provides a model worth emulation: parcel records are updated and stewarded across hundreds of townships in a highly dynamic and technically accurate environment.

The MRS/LURC system is ESRI-based and while remaining operational is beginning to show its age. Functionality decay has occurred in this system in recent years as foundation software upgrades have rendered some of the LURC system extensions brittle and undependable.

The most effective promotional activity that could be directed toward bringing this system into an integrated environment would be assisting in specifying and delivering software and system upgrades. The database and logical underpinning of this system are sound, and it provides potential to inform and even extend service to towns outside of its existing domain.

Utilizing the intelligence and functionality of this system is key to any statewide plan. Ongoing promotional and coordination activities must exercise technology transfer both in and out of this MRS/LURC installation by keeping keenly aware of its needs and working to help satisfy them in the context of the overall Maine land records context.

3-6. TIER 2 – LAND DATA CONSUMER PROMOTION

Nearly any geographic analysis undertaken in the state does or would benefit from availability of property dimensions and attributes. Many organizations and individuals have specific and pressing needs for integrated land data access, as is evidenced by turnout and input during the Strategic Planning forums and workshops over the past months. Some are actively trying to assemble the necessary data for specific areas of focus in Maine. Others are merely interested in the opportunities opening up these resources may provide.

Promotion of integrated land data to these groups necessarily varies depending on functional requirements. It is safe to assume though, that with a functioning data chain anchored by the Tier1 providers, these groups will benefit greatly.

The following list of workshop participants and other interested parties captures major classes of potential integrated land data users and some of the promotional considerations applicable to them.

Educational Institutions

University of Maine at Machias
University of Maine at Orono, Spatial Information Science +
Engineering
University of New England
University of Southern Maine, Environmental Finance Center
Colby College
Bowdoin College

Promotion through key active faculty and departments; technology transfer through workshops, shared tools;

Associations, Land Trusts and Not for Profit Organizations

Androscoggin Land Trust
Forest Society of Maine
GrowSmart Maine
Island Institute
Maine Audubon
Maine Coast Protection Initiative
Maine Land Trust Network
Maine Municipal Association
Maine State Bar Association, Title Committee
The Nature Conservancy
Wells National Estuarine Reserve

Promotion and participation through collaborative contact; strong potential as sponsors, technical participants in service areas; opportunities for providing core automation and editing services;

Utilities

Bangor HydroElectric
Bangor Water District
Portland Water District
Maine Public Service Company

Promotion and participation through direct contact; potential sponsors in service areas;

Government Councils, Regional Planning Agencies

Androscoggin Valley Council of Governments
Eastern Maine Development Corporation
Greater Portland Council of Governments
Hancock County Planning Commission

Promotion through direct contact by Land Records Coordinator, GeoLibrary and cohort organizations; potential sponsors in service areas

Kennebec Valley Council of Governments
Mid-Coast Regional Planning Commission
Northern Maine Regional Dvlpmnt. Com.
Penobscot Valley Council of Governments
Penobscot Indian Nation
Southern Maine Regional Planning Commission
Washington County Council of Government

State Government Departments and Agencies

Maine Archives
Maine Bureau of Public Lands
Maine County Commissioners Association
Maine Department of Conservation
Maine Department of Economic and Community Development
Maine Department of Environmental Protection
Maine Department of Fish + Wildlife
Maine Department of Health + Human Services
Maine Department of Marine Resources
Maine Department of Transportation
Maine Forest Service
Maine Geological Survey
Maine Natural Areas Program
Maine Office of Information Technology
Maine Parks + Lands
Maine Public Utilities Commission
Maine Revenue Service
Maine State Housing Authority
Maine State Planning Office
Somerset County EMA

Differing opportunities for promotion and support; most data use will likely be restricted to parcels following National Mapping Standard;

Federal Government Departments and Agencies

US Department of Agriculture, Natural Resources Conservation Service
US Environmental Protection Agency, RCRA
US Fish + Wildlife Service
US FEMA, Region 1
US Geological Survey, National Mapping Program
US Office of Management & Budget
US Bureau of Land Management
US Parties to OMB Circular A-16

Widely varying opportunities and challenges for promotion; some agencies will add considerable value to data through attribute enhancement; maintaining active relationships to core data users and fostering intercommunication between cohorts of common need will serve to effectively promote data use;

Commercial Interests

Aerial Survey + Photo, Inc.
Aptitude Solutions
Bernstein Shur
Bowdoin Associates
DeLorme
Dirigo Spatial
Hannaford Company

Horizon Surveyors
Huber Resources
Jensen, Baird, G+H
JW Sewall Co.
KAPPA Mapping, Inc.
Landata
Mitchell Geographics
NavTeq
Partners for Recreational LU
Planning Decisions
RCAP Solutions
Rudman & Winchell
Sebago Technics
Spatial Alternatives
UPC Wind Management
The Warren Group

Commercial interests represent a largely unbounded group of potential users who will typically find ways to make use of a reliable data source when such a source becomes available. Promotion of concept and product to this class of users will rely on specifics of the ultimate functional specification of the integrated land records system.

3-7. TIER 3 CANDIDATES + PROMOTION

Tier 3 integrated land records participants include technical vendors and facilitators. Technical service providers are an indispensable component of land records automation and maintenance and should be considered a part of the promotional planning landscape.

At the county level, providers of online data services comprise a small number of companies that provide web-based data access of County document repositories. These include Browntech, Landata, Aptitude Solutions and MaineLandRecords.

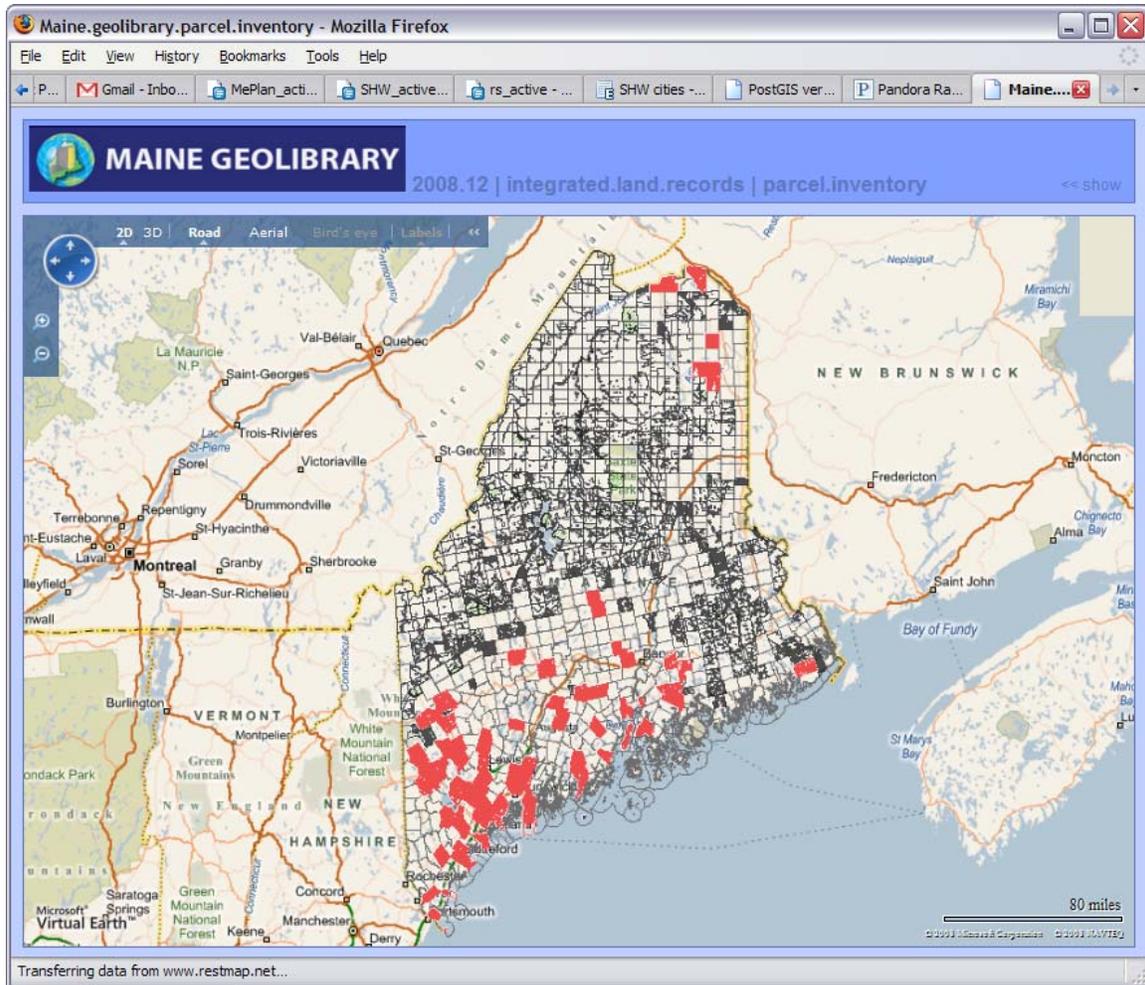
These companies are singled out because they presently provide the pipes through which a considerable volume of county documents flow to users. In most cases their technology would need to be directly interfaced with (or bypassed) to integrate parcel based data with Registry holdings.

Other commercial entities which share an analogous relationship to parcel data must be considered as an integral part of the system as well. These include:

- Surveyors: active users of deed and survey data, but also vital producers of the highest quality property boundary documents. For promotional purposes, GeoLibrary or cross-jurisdictional land records representation should attend surveyor meetings; technical requirements should be actively solicited from surveyors as part of land records functional specification development.
- Tax mapping contractors: provide proxy technical assistance for towns. The GeoLibrary/Digital Land Records Coordinator should actively familiarize these contractors with MeGIS/GeoLibrary parcel standard specifics, should work with them to evolve a preferred bidders list or equivalent mechanism for identifying qualified contractors, and should work to promote use of in-state and locally proximate firms when possible.

3-8. PROMOTIONAL TOOLS

Functional software tools – even very simple ones - can be very effective in advertising basic concepts of the ILRIS concept and benefits. As discussed in earlier sections of this document, some of these tools could be implemented to provide basic capabilities that GIS users are familiar with. These include display and query functionality of digital parcel data that already exist as the result of MEGIS/GeoLibrary parcel grant initiatives since 2003.

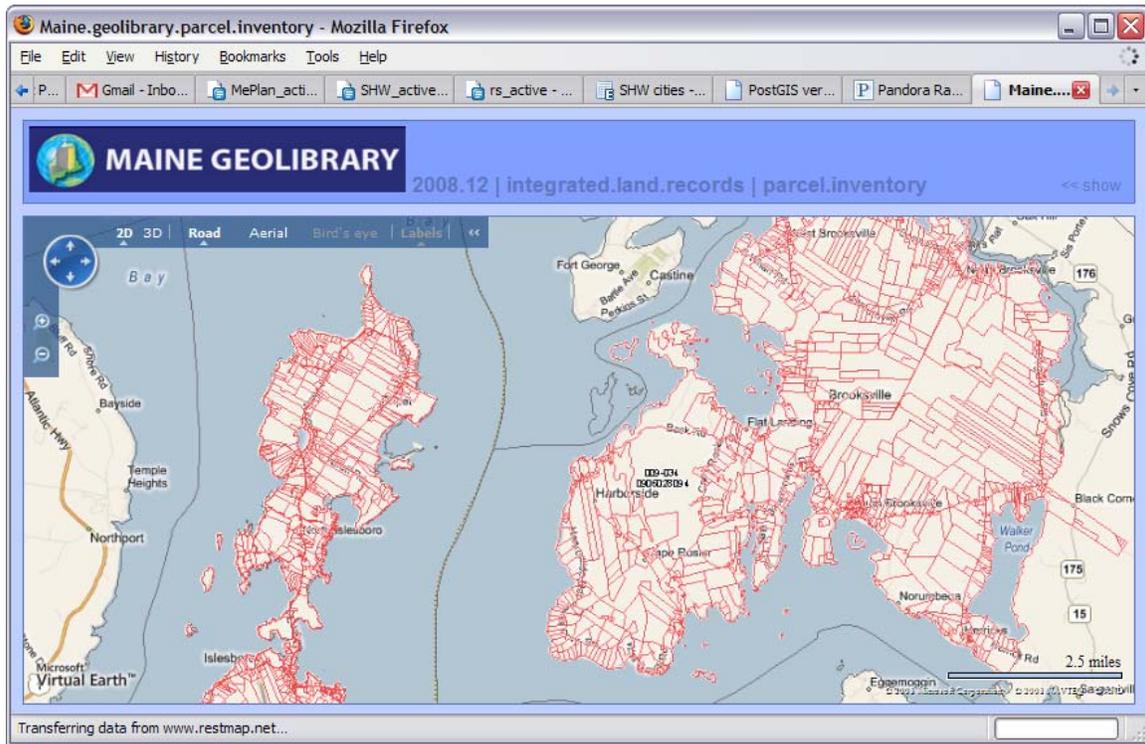


The Maine GeoLibrary ILRIS parcel inventory viewer shown here may be used to quickly pan and zoom around the state to display parcel completeness and quality for all 70+ municipalities that have participated in the two rounds of grants. Parcels for the Unorganized Territory are also included, as are those in a small number of additional municipalities that have contributed their parcels for evaluation purposes.

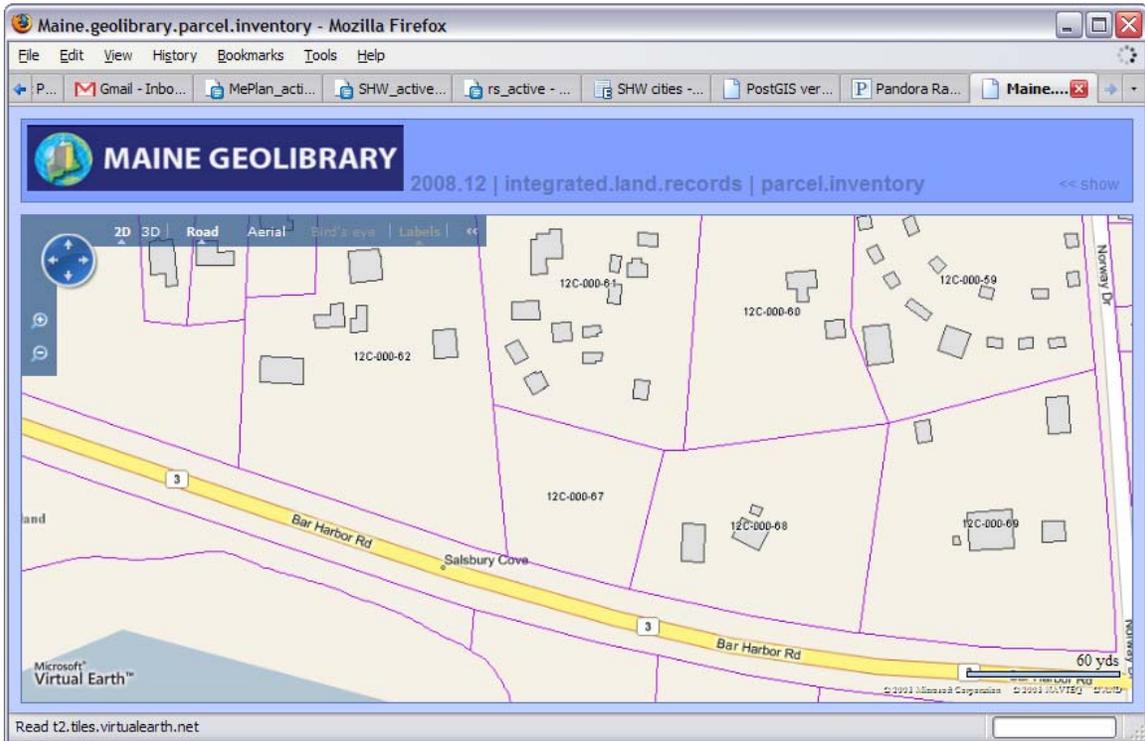
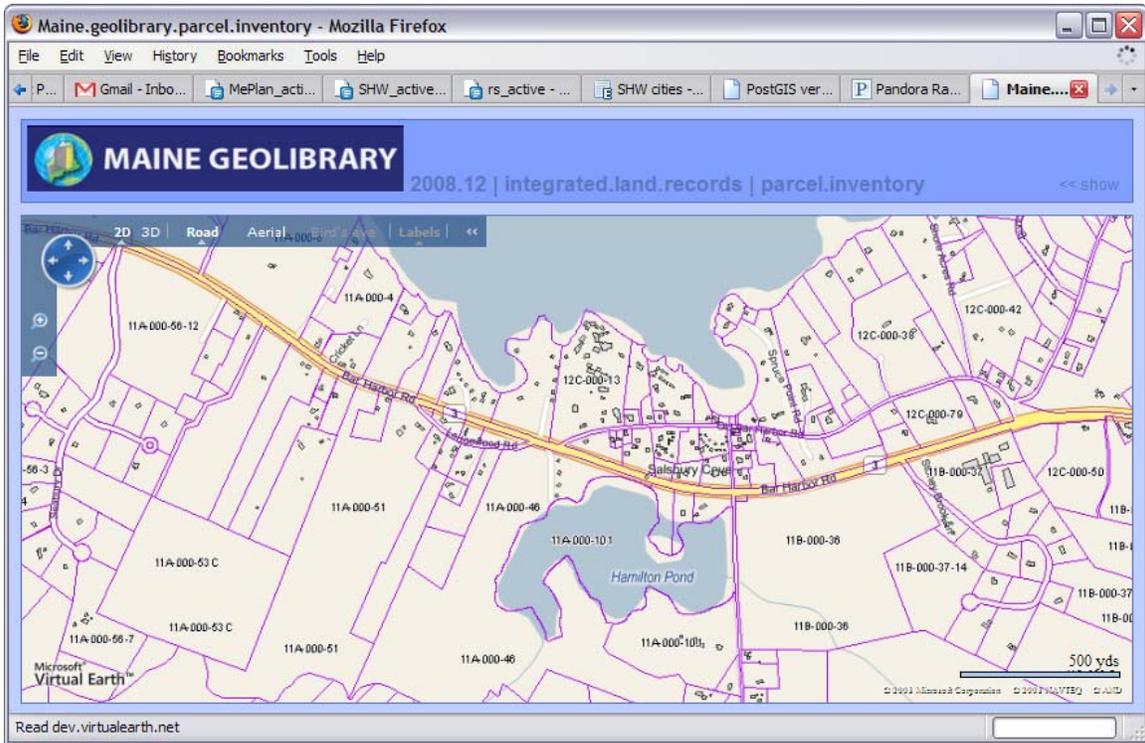
This particular tool presents the data as “cached tiles” that overlay commercial data from other sources (primarily Navteq) within a publically accessible framework provided by Microsoft Corporation. Similar

frameworks are available from Google and others, provide free and accessible bases to layer Maine data on top of.

As is evidenced below, entire towns can be reviewed quickly this way, without “click and wait” delays or any software other than standard web browsers.



Content can also be crafted to display differently at various scales to most effectively meet user needs.



This tool was developed rapidly as a both a demonstration and as a means to visually share parcel status throughout the state in a way that has traditionally only been available to desktop GIS users with expensive and complicated software.

It is live and accessible from:

http://www.restmap.net/me_geolib/atlas/tiles_lurc01/Layers/veviewer_rest.html

It will continue to be hosted without fee as a project deliverable for as long as the Maine GeoLibrary deems it useful.

3-9. PROMOTIONAL MATERIALS - HARDCOPY

Hardcopy materials for handout and targeted distribution have been useful and will continue to benefit this initiative going forward. In March 2008 a project promotion card was printed and distributed at the annual Maine Municipal Association meeting at the Augusta Civic Center. This card was also distributed at a number of subsequent presentations and helped to emphasize the simple message: Why is digital access to an inventory of Maine property data not more accessible.

Imagine that to assemble the map of
Maine Land Ownership,
you will need to visit need to visit
500 different bookstores.

This is the how property parcel information in our
state is currently maintained and distributed.

Integrating land records information from municipalities and
county deeds registries has finally become technically and
economically feasible. By filling in the gaps in Maine's land
ownership mapping and bringing data up to common standards
there are significant benefits to be gained, including:

- Providing information infrastructure for
Regionalization
- Streamlining local property assessment and
relieving burdens on local government
- Assisting economic development projects
- Providing a common operating picture for all
government and commercial interests
- Managing catastrophic emergency (violent
storm, fire, flood) situations
- Improving access to federal funding for
technology and land-related initiatives

**The Maine Library of Geographic Information
GeoLibrary**

Requests your support for and participation in the
**Integrated Land Records
Information System
Maine Assessing Parcels Collaborative**

As part of the
Maine 2008 GIS Strategic Plan Update

The GeoLibrary will update and enhance the existing Maine Strategic Plan,
focusing on coordination with local governments, academics, and private
interests. Our aim is to develop sustainable funding sources and cultivate
deeper political and public support for these vital technologies.

At the core of this planning process will be research and creation of an
integrated land records information system for Maine. This will be
designed to be sustainable politically, technically and economically and
meet needs of users at all levels of government and the private sector.

**Success of this project will require active participation by a
wide range of geospatial data managers, data stewards,
property records users and GIS stakeholders.**

For more information about this strategic planning initiative
and integrated land records information in Maine, please
visit:
<http://maine.gov/geolib/>

There will be ample opportunities for more promotional materials of this type. Bulk mailings and leaflet distributions are traditionally a low-percentage approach to message conveyance. Still, in certain circumstances they are a useful means for targeting succinct messages to legislators, local officials and even voters in elections where bond funding stands to benefit ILRIS and other geospatial project.

3-10. PROMOTIONAL MEETINGS: COMPLETED + PLANNED

From project kick off in early 2008 a number of informational, promotional and fact gathering activities have taken place to move the initiative in front of potential users and contributors. These activities have included:

2008

- April: Maine Municipal Association / Technology Conference; Augusta
- May: Informational Forum 1: Auburn
- May: Informational Forum 2: Bangor
- May: Informational Forum 3: Augusta State Departments
- May: Informational Forum 4: South Portland
- June: Presentation before title attorneys, Augusta
- June: Presentation for Electronic Records Workshop, Caribou
- May-July: Meetings with key executives and professionals including the CIO, GeoLibrary Board members, Maine Revenue Service, LURC and others
- September: MEGUG Fall 2008, Presque Isle
- September: Maine County Commissioners Meeting, Presque Isle

2009

- January: Maine GIS Exhibition – Statehouse Demonstration
- May: Maine Society of Land Surveyors, Westbrook/Portland
- May: Surveyors 2
- August: State of Maine Property Tax School (scheduled)

Because ongoing progress of this initiative will require incubation of interest over an indefinite period, future presentations and incremental announcements will be of significant benefit.

3-11. PROMOTIONAL ACTIVITIES: CONCEPTUAL FRAMEWORK

The following promotional goals were identified during development of the Conceptual Framework component of the ILRIS project.

Promote Land Records Benefits to Technical Users + Analysts (Goal 08)

Develop effective technical infrastructure for providing access to land records data with minimum thresholds (cost and skill) to entry

Paths to goal:

- Host data securely and dependably
- Build application programming interface (API) to permit access to and use by different tiers of stakeholders (formally restricting access according to GeoLibrary-established rules)
- Advertise existing and potential content to qualified vendors and technical facilitators to foster public/private collaboration
- Direct promotion and appeals to specific categories of users
 - Data providers and stewards
 - Registries

- Assessors
- Data aggregators, technical facilitators and vendors
 - Regional Planning Agencies
 - Tax mapping companies
 - Appraisers
 - Deeds automators + distributors
 - Surveyors
- Current users
 - DOT, DEP, SPO, MRS
 - Environmental, Health
 - Land Trusts
 - Utilities
- Potential High Yield Users
 - Title Attorneys
 - Real Estate brokers, investors and developers

Promote Land Records Benefits to Solicit Funding (Goal 09)

Advertise and socialize successful parcel and land records-based analysis to policy makers and fiscal enablers.

Paths to goal:

- Promote policy analysis using existing parcel (especially inter-municipal) data sets
 - LURC: Plum Creek: wind energy implications;
 - Brunswick BRAC considerations: foreclosure tracking
- Leverage statewide plan toward implementation funding
 - FGDC

Maine GeoLibrary Board
Integrated Land Records Information System

Section 4:
RESEARCH PLAN and FINDINGS

July 2009

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4-1. INTRODUCTION

The Maine Library of Geographic Information (“Geolibary”) has been working with the Maine Office of Information Technology and the Maine Office of Geographic Information Systems (“MEGIS”) to help the State develop geographic information system (“GIS”) capabilities to promote efficient government administration and land use planning. Since April, 2008 the GeoLibrary has been gathering information to assist Maine in designing a GIS-based integrated land records information system (“ILRIS”) which would facilitate access to information about a particular parcel and adjoining lands. This effort has in part been funded by a \$50,000 grant by The Federal Geographic Data Committee (“FGDC”) which promotes the coordinated development and dissemination of national geospatial data. The grant monies were obtained from the FGDC’s Fifty States Initiative and have been supplemented by contributions from the Geolibary and MEGIS¹.

The Maine ILRIS would build upon and enhance the accessibility and utility of geographic information now maintained by data stewards at all levels of Maine government. Once implemented the ILRIS would allow all persons interested in the attributes of a particular parcel (among them, title examiners, planners, conservationists, and developers) to see a parcel on an aerial photograph (map quality orthoimagery is the desired standard), and readily access information about land cover, roads, protected lands, soils, wetlands, aquifers, geology and other pertinent geography. Under the envisioned ILRIS this information would also be linked with parcel title information maintained in the county deed registries. The current GeoLibrary project is a first step in determining how best to create these links.

- **Section 2: Maine Municipal, County & State Status.** This section identified which land data is of greatest interest, current status of municipal lands data, issues associated with standardization of data and consequences of the lack of incentives, current status of County records and potential benefits of geo-referencing this data, interaction between municipalities and counties, and a national model for parcel data.
- **Section 3: Comparative State Experiences.** This section provides an overview of other state systems providing relevant benchmarks and how they might pertain to Maine’s experience.
- **Section 4: General Benefits of Maine Integrated Lands Records.** This section articulates the broad benefits to active land records data consumers and potential high-benefit lands records data users.
- **Section 5: Stakeholder Inventories.** This section provides an inventory of beneficiaries of an ILRIS.

4-2. GOALS

The primary objective of the ILRIS program is to achieve greater efficiencies in land records data collection and maintenance while improving quality of service to data users at all levels of government and in the private sector.

Project stages of the ILRIS initiative include Research, Promotion, Conceptual Framework Development and creation of Functional Specifications. Each of these stages has involved and will continue to involve interacting with and soliciting input from a large number of land records stakeholders.

These stakeholders can be divided into three primary categories:

- **Tier 1: data producers** and stewards of property-based data; primarily State and Municipal Assessors and Land Use and Zoning Administrators and County Deeds Registers
- **Tier 2: active land records data consumers** and potential high-benefit land records **data users**, comprising the full spectrum of government, commercial and citizen users, some of whom may add content to the geographic information database(for instance, through registration of land transfer documents);
- **Tier 3: technical facilitators and vendors**, including mapping companies, GIS firms, surveyors, appraisers and others;

This document identifies the status, needs and capabilities of all three, with a focus on Tiers 1 and 3, as these stakeholders provide the core geometry and attribute content upon which all downstream users will depend. Potential and identified uses of integrated land records for Tier 2 users are identified in Section 5.

Significant opportunities exist to leverage rapidly maturing information system technologies to cost-effectively integrate Maine parcel data editing and distribution processes and deliver higher quality content to a larger population of end users.

From input gained to date using statewide GeoLibrary project forums, workshops, meetings and evaluations of existing systems, a core group of project goals is emerging. These findings indicate that a successful implementation for Maine should:

- Remedy existing discontinuities that exist between municipal parcel maintenance (for tax assessing purposes) and county maintenance (for deeds and registered surveys)
- Reduce inconsistencies in data quality and currency by instituting standard digital parcel and attribute products and services
- Encourage access to land records data with minimal technical or economic barriers to entry – make existing data accessible to more users
- Increase access to data that are not currently geographically enabled or easily searchable and integrated with GIS technology – make more data available to existing users

Functional and line-of- business considerations of numerous classes of existing and potential data users need to be considered to:

- Expand municipal uses where digital parcels exist and expand digital parcel coverage into currently unmapped areas
- Increase overall utility of and access to digital land records data by public and private decision makers
- Support land use permitting and compliance review

Any system should also:

- Adhere to existing State GeoLibrary digital parcel standards
- Integrate efficiently with overall state and federal geospatial data infrastructure objectives
- Include provisions for standardizing land use codes
- Facilitate higher quality analysis between and among different agencies and individuals
- Be supported by high profile and vocal political champions who understand and believe in its benefits
- Have realistically estimated costs over defined time horizons
- Be funded sustainably

Throughout the data gathering exercises, consistent and frequently stated public opinion declared that a successful integrated land records system must NOT:

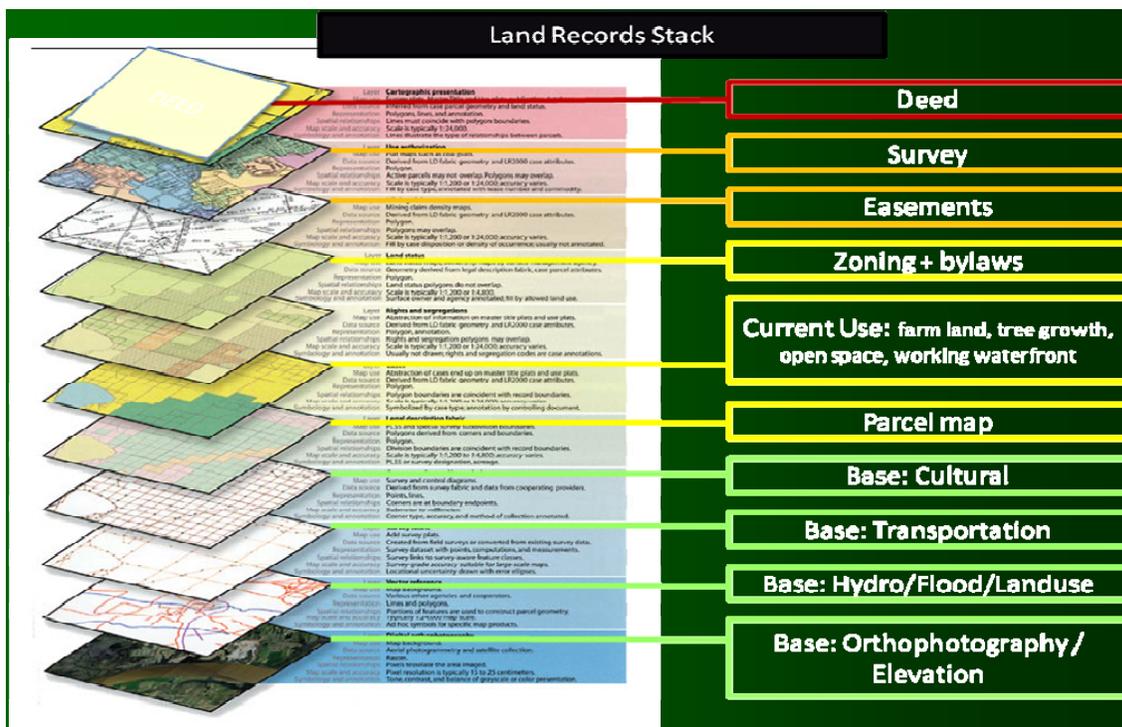
- Add additional workload to existing data maintenance stewards
- Increase the risk of loss of data control and self-determination to commercial implementers or vendors
- Compromise the privacy of individuals or organizations

4-3. MAINE MUNICIPAL, COUNTY + STATE STATUS

Introduction

The Land Records “Stack” depicted in Figure 2-1 represents a typical GIS layering model of commonly geo-referenced information. While this type of graphic is a fairly common schema used to depict GIS technology, this particular example focuses on the yellow, orange and red layers toward the top, which pertain to geospatial land records data. Beginning with parcels and sub-parcel-related geography-anchored content, these culminate in the deed with attendant survey and easement resources directly beneath.

Figure 2-1: GIS Land Records Data



The message in this diagram is simple: the data of most immediate utility for land ownership and rights information rises to the top. The green boxes beneath contain only a representative subset of the vast amount of geospatial data in the state’s geographic information system that may be used in conjunction with land records in a fully integrated land records information system. Deeds, surveys, easements, zoning and bylaws, exemption polygons and parcels define not physical or even visible features, but record property rights, taxation and conveyance information that is of vital utility both in and out of government. The usefulness of these data increase dramatically when combined with information already available in the state’s GIS.

Project research shows that collection and maintenance of the land records information in Maine currently mixes modern information technology with traditional paper-based approaches. While many technically and organizationally forward-looking data storage and

access implementations operate in pockets throughout the state, significant inefficiencies and inconsistencies persist over large areas.

Tier 1 stakeholder - Municipalities

Parcels: Completing the Coverage

As a foundation layer, property parcel data are invaluable to GIS analysis across practically all sectors of government, non-government, and commercial land-oriented organizations.

At the municipal level, tax assessors have historically been the early adopters and core users of parcel data. But other departments including Public Works, Schools, Conservation and Recreation, Health, Planning, Zoning, Police, Fire, and Inspection Services increasingly rely on these data when they are digitally available and dependable. Essentially, parcels provide an indispensable building block for municipal GIS across all departments.

Evidence suggests that converting paper-based parcels to a functional digital format has traditionally been expensive and technically challenging. Because of this the larger, better-funded Maine municipalities have moved to digital first.

Table 2-1 shows the cities and towns in Maine with the highest parcel counts.

Table 2-1: Top Maine Municipalities by Parcel Counts

Municipality	Parcels	Population
Portland	22,500	64,249
Lewiston	12,152	35,690
Bangor	9,973	31,473
Auburn	9,306	23,690
Sanford	9,214	20,806
York	8,979	13,306
South Portland	8,593	23,324
Augusta	8,428	18,560
Scarborough	8,010	16,970
Windham	7,920	14,904
Saco	7,907	16,822
Biddeford	7,730	22,072
Brunswick	7,144	21,172
Wells	6,839	9,400
Gorham	6,505	14,141

A strong correlation exists between population and parcel count, though it is not exact. At the national level, this ratio tends to hover around 2 inhabitants per parcel, though in Maine the number of parcels per people is somewhat higher. Some Maine communities with large numbers of seasonal dwellings have inflated parcel counts. All of the cities and towns in Table 2-1 have digital parcels and have working GIS operating at different functional levels.

As depicted in Table 2-2, the 15 municipalities shown in Table 2-1 account for approximately 20% of the total number of parcels statewide.

The top 75 municipalities in Maine, or 16% of the 470 municipalities total being tracked by the Maine Bureau of Revenue Services (MRS), account for approximately 50% of the total parcels.

Table 2-2: Segments of Municipalities and Percentages of Parcel Data

Segment	% of All Towns	Parcels	% of All Parcels
Top 15	3%	140,000	20%
Top 75	16%	375,000	50%
All Towns (470)	100%	750,000	100%

This is a striking statistic. It provides strong evidence that much of the heavy lifting in parcel data development, especially in densely developed areas, is already in place or under way. And since it leaves such a large number of small communities with a lot of land area but very low populations, revenue and parcel counts, it suggests that many of these remaining communities without digital parcels might never be in a position to develop these data on their own.

Parcel Development: Ad Hoc to Standard

While real property ownership and taxation records have been recorded in and about Maine for nearly 400 years, converting Maine parcel maps to electronic formats for use in computerized mapping applications is a relatively recent development. This began in the late 1980's by larger cities and towns as well as some northern forest property owners. The trend has been augmented and accelerated in Maine somewhat by the local presence of numerous digital mapping firms and educational institutes of national stature.

Parcel inventories have traditionally been maintained as maps, on paper or mylar and at scales ranging from 1"= 40' to 1" = 200'. Such parcel inventories provide the only means to associate both mathematically and visually all individual records in an assessing database to a geometrically accurate, graphical representation of these records.

Municipal parcel automation, from paper to digital, is usually accomplished by digitizing an entire municipality at once to maximize consistency and data integrity. Parcel geometry from multiple paper, linen or mylar sheets (typically at scales ranging from 1"= 40' to 1" = 200') is automated and edge-matched. These data must then be matched against tabular records of individual properties to enable them geographically.

Such initiatives can represent significant expense for small communities. Properly quality-controlled parcel automation projects tend to cost between \$3.50 and \$6 per parcel, and can run significantly higher if the quality of source manuscripts is poor or out of date requiring time intensive deed research.

In communities where digital parcel data are available, there is generally a strong consensus that having this information readily available to the public, particularly to developers and project proponents, is beneficial to community health and well-being.

Occasionally, towns and cities federate together to enjoy economies of scale and technology transfer, and build their systems in tandem. Cases like data development in Lewiston and

Auburn provide an example of this, where two separate municipal systems exist but much of the data and interface work has enjoyed the benefits of parallel development. In 2006/07 Lewiston and Auburn water and sewer districts were aerially photographed in tandem, providing valuable base data for parcel updates and other applications. Numerous other examples of collaborative data acquisition on regional scales serves a valuable precedent, and approaches of this type may be very attractive as a means to automating and enabling geographic capabilities in towns that, alone, would have difficulty mobilizing necessary resources.

Maine has an effective and functioning parcel standard that was established by the Maine GeoLibrary following the Statewide Resolve 23 Plan of 2002. This standard provides a stable template for data automation and update and will permit compliant data to conform into a working composite of great practical benefit to a large number of land records data stakeholders. Adoption of parcel data standards also increases Maine's federal funding opportunities for uniform GIS promotion.

Nearly 80 municipalities in Maine have participated in two rounds of parcel grant funding by the GeoLibrary helping to standardize data quality in many areas of the State. Enforcement of a standard through targeted incentives is a proven, effective way to move the State toward a functioning ILRIS.

While some issues (such as edge matching across town boundaries) remain, the combination of available grant funding and active use of the GeoLibrary's state parcel standard provides a clear development path for bringing most or all remaining parcels into compliance.

A frequent criticism of the GeoLibrary grant program has been that there is currently no mechanism in place to guarantee (or even actively encourage) submission of updates as these occur. Because the parcel landscape is never static, the lack of this mechanism necessarily causes data to go stale quickly and compromises the overall utility of the parcel composite.

In addition to the state parcel standard, development of complementary data standards may be advisable to ensure workable deployment of statewide parcels as well as maintenance and integration with other layers. These complementary standards could include:

- Structure standard: to ensure that building data overlays cleanly with parcel data as these two layers are developed
- Computer Aided Design and Drafting (CADD) submission standards: to facilitate ingestion and integration of survey quality data directly into storage repositories and GIS
- Road centerline standard: to synchronize road segment address ranges and positional data placement with property parcel data

Tier 1 Stakeholder - Counties

Deeds Registries

County Deeds Registries in Maine and New England maintain an attenuated relationship to the rest of the overall geospatial community. Registries serve as the deepest reservoirs of geographic information governing title to real estate. Geographic information systems are

designed and built around accessing and integrating different reservoirs of geospatial information, yet there is little GIS activity in or around any of the County Registries.

This paradox is primarily attributable to the fact that Registry data have not been enabled geographically (“geo-referenced” for use in a GIS). Deeds are textually descriptive, and even while a large proportion of these have been scanned into image files, these provide no direct, automated link to location using computerized mapping software.

From an historical perspective this is understandable. Registries are run like libraries. What the Registers do and do well is maintain indexing and accessibility to the documents in their repositories. They have little need to analyze or aggregate their content. And with no current business requirement or incentives for context information concerning deeds, few natural geospatial developments have occurred.

But project research identified three core areas where a tighter county-GIS relationship could provide considerable benefits across a large array of stakeholders including:

1. Geo-referencing scanned survey plans to use as a reference layer and a resource for improving flawed geometry in GIS layers [incorporated in what? could this be clarified?] to certified accuracy. Approximately 120,000 survey plans have been identified across Maine’s 18 Registries.
2. Instituting a parcel identifier – possibly x, y coordinate based, that allows registry documents to be queried from a map interface (e.g., show me all of the plans, deeds and other documents within a half mile of an identified brownfield remediation site).
3. Utilizing the physical location and land records assets of County Registries to anchor one or more GIS Service Centers. Locating small technical offices containing hardware, software and geospatial expertise within County Registries would provide an interface opportunity with not only the Registries and their data but with other County departments as well as local municipalities and the public at large. Operationally this would be similar to the manner by which select Regional Planning Commissions throughout Maine provide parcel maintenance and other GIS services to municipalities.

This is an important metric to consider when evaluating potential costs and strategies for digitizing parcels in groups. It is worth noting that dozens of *counties* across the US have parcel counts exceeding the overall state total for Maine.

Further, the three counties with the lowest counts (Piscataquis, Sagadahoc and Franklin) do not in total have as many parcels as the *city* of Portland.

These parcel quantities speak to the fact that the primary impediment to a statewide cadastral mapping is not one of

County	Parcel Count
ANDROSCOGGIN	45,540
AROOSTOOK	46,873
CUMBERLAND	125,010
FRANKLIN	22,887
HANCOCK	48,063
KENNEBEC	65,549
KNOX	28,709
LINCOLN	28,078
OXFORD	43,346
PENOBSCOT	104,970
PISCATAQUIS	17,558
SAGADAHOC	19,046
SOMERSET	35,791
WALDO	27,711
WASHINGTON	26,418
YORK	104,140
State Totals	789,689

technical complexity of the sheer number of features requiring automation. The challenge has more to do with harmonizing the many subcomponents of each of these counties to produce and maintain these features over time.

Table 2-3: Parcel Counts by County

Tier 1 Stakeholder – The State

Parcels: Statutory Support

Under Maine law, the MRS must annually certify to the Secretary of State before the first day of February the equalized just value of all real and personal property in each municipality and unorganized township that is subject to taxation. Each community is required by statute to maintain a complete inventory of property as part of the overall property tax assessment process¹. Unfortunately, at present there is no requirement to use map-based data for this purpose.²

Where up-to-date parcel data exist, establishing just value is a far less challenging, time consuming and error-prone exercise than where they do not.

County-Municipal Land Records Data Exchange

Across most of the United States, tax and ownership data relating to real estate are managed from one location: the county registry. In Maine, as well as much of New England, this is not the case. Here the management responsibilities are separated between municipality (taxation-parcels) and county (ownership-deeds). The basis for this separation is rooted in historical and local factors, but with the availability of modern information technology any technical reason for such division of labor has disappeared.

Of course these two management entities need to interact over ownership and rights issues concerning specific properties. For valuation and taxation purposes specific paths of data flow and transaction-based communications are required. The most frequent and important of these revolve around administration of the Real Estate Transfer Tax (RETT) by the MRS.

In brief, this process involves a multi-level exchange of data between MRS, Maine's 18 County Registries, and the hundreds of organized towns and cities throughout the state where the land is located. Specifically, after deeds have been filed with accompanying real estate transfer tax declaration at a registry, a copy of the declaration is provided to the MRS in order to log this change in land value and disposition in the central state revenue database.

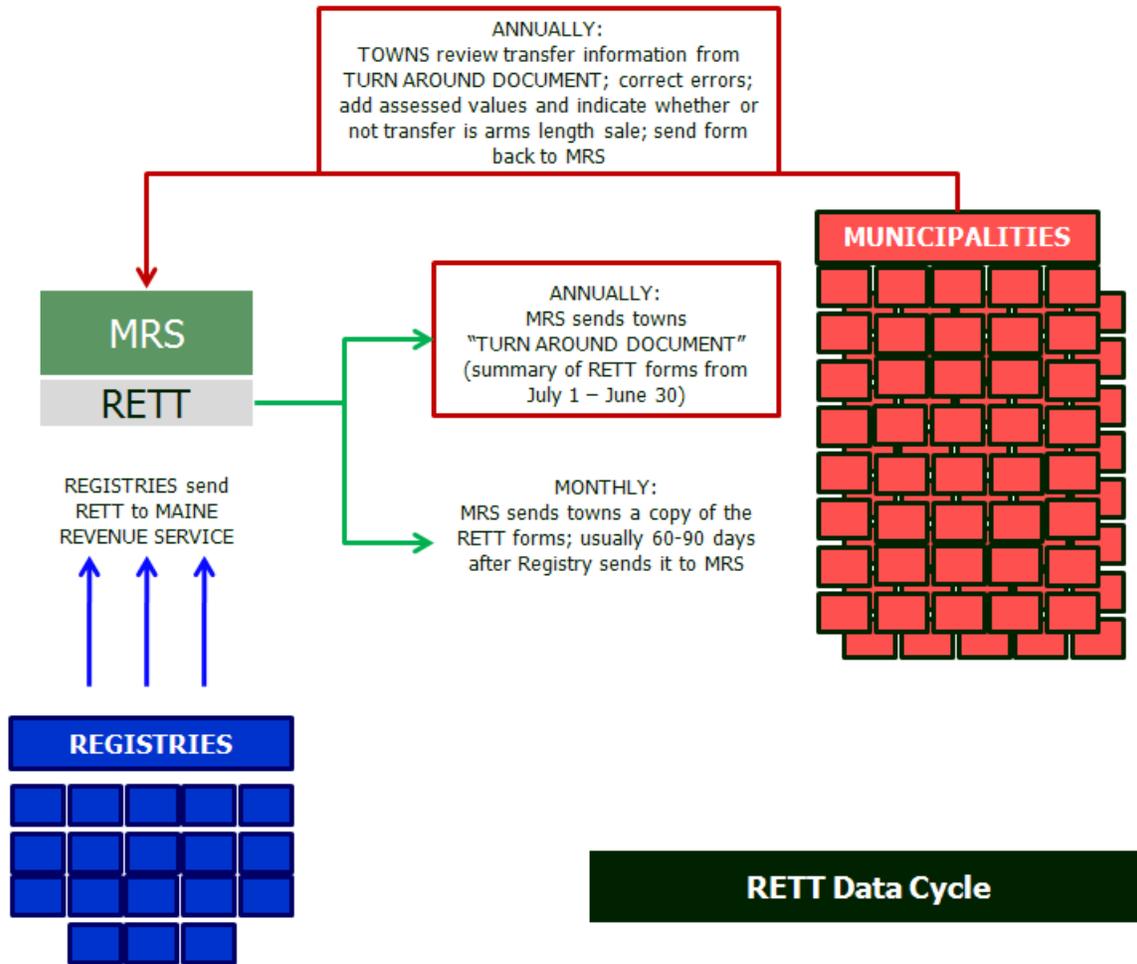
Once the registry-specific book, page and ownership data have been entered, the MRS conveys the form to the appropriate municipality so that additional information may be attached that is pertinent to property-specific taxation and exemption details. This includes data relating to exemptions such as participation in Maine's Tree Growth programs as well as the Map and Lot identifiers that the municipality uses to index this property in its local system.

¹ MRS Property Tax: MRS Title 36;

² MRS Title 36, Chapter 102, Section 328: 9. Tax maps: Municipal assessing units do not necessarily have to maintain tax maps

With these additional pieces of information added, the towns send the RETT forms back to the MRS to be logged centrally. Figure 2-1 outlines these relationships.

Figure 2-1: Process for Processing RETT Forms



The technical details and daily burden of these interactions produce many complaints among participants. Multiple data entries produce numerous points of potential error. Data do not always effectively and accurately make their way back to Registries and municipalities. Municipalities may not take the time and care to research proper parcel map and lot numbers. As a consequence, a significant proportion of the data content (outside of the registry-essential Book/Page identifiers and ownership information) is often considered to be suspect or wrong.

MRS is currently working to design a future all-electronic version of this RETT data transmission cycle, but at time of this writing, its details are not settled.

The electronic exchange of geospatial data among these levels of government would add value and resolve current inefficiencies. For example, information reported in RETT allows tracking of classified lands benefitting from current use taxation programs (Section 8 of the form). These classified lands include Farmland, Open Space, Tree Growth and Working Waterfront. If the RETT data associated with these properties are properly maintained and documented, this can provide significant tax benefits to property owners. Presently the geographic data used to track

these significant and valuable assets are poorly defined and difficult to use for inventory purposes.

The sheer magnitude of the numbers involved in exempt properties and classified lands suggests that careful tracking of these data ought to be a high priority. Research during this project has confirmed that making the inventory system for these data as robust and error-free as current technology will allow is an objective strongly held by many, including MRS officials.

Table 2-4 below provides a snapshot of land-based Classified and tax-exempt properties.³

Table 2-4: Current Number and Value of Exempt and Classified Lands

	Total Properties	Total Value
Tree Growth	22,900	\$403,500,000
Farmland (cropland + woodland)	3968	\$49,000,000
Open Space	1715	\$109,000,000
Working Waterfront	39	\$7,300,000
Totals		\$568,800,000
Exempt: US Government		\$3,022,000,000
Exempt: State of Maine		\$1,976,000,000
Exempt: Municipal Corporations		\$4,269,300,000
Exempt: Public Water Supply		\$80,000,000
Exempt: Airports		\$246,000,000
Exempt: Sewage		\$42,000,000
Totals		\$9,635,300,000

That Maine government cannot identify these properties as parcels on a map is unfortunate but in no way surprising. The US federal government does not maintain a parcel-based inventory of its holdings (despite at least three attempts over the past fifteen years to accomplish this). Most US states do a poor job at this as well. But considering the tens of thousands of properties involved as well as the billions of dollars of land involved, tracking these assets using geography-based information technology tools could yield formidable resource benefits.

The cost of maintaining the status quo in this regard is not immediately apparent, because potential benefits will not be evident until the data are carefully scrubbed and sequenced. But, by example, it is possible, with a single press of a button, to query one of the nation's many million-plus parcel counties that is fully automated and geospatially enabled, or to make a one-line database interrogation that produces a list of all records (with verifying maps) representing exempt properties.

In a situation of fiscal uncertainty and strained government budgets, IT investments directed toward infrastructure and asset tracking are particularly vital. If for no reason other than to

³ Figures from MRS 2007 MRS Valuation Return Statistical Summary.

preserve institutional memory in times of accelerated layoffs and employee turnover, investing in information systems that facilitate accurate and transparent data visibility should be viewed as a worthwhile funding priority.

Parcels: The National Vision

The national model is described here because many of the principles are scalable and directly applicable to data sharing and coordination within Maine. The concept of Land Records Coordinator, explicitly identified as an essential resource for interface with the federal level, is a staffing responsibility that Maine will ultimately need to consider if this interface is to be properly cultivated.

At the federal level there is growing use and appreciation of unified parcel data as a resource for government. Serious studies of a standard, national cadastre have been evolving since 1980 when the National Research Council (NRC) issued a report titled *Need for a Multipurpose Cadastre*. In a recent study, the NRC has determined that complete national land parcel data in the United States “are necessary, timely, technically feasible, and affordable.”⁴

The national vision is being developed and formalized by the Bureau of Land Management within the Department of Interior (DOI), with a team including the FGDC, the Department of Homeland Security, the Census Bureau and others.

This national vision stipulates a border-to-border cadastral fabric that largely follows carefully defined principles. According to the recent NRC study, an integrated and comprehensive national parcel system should be:

- Distributed with data capture and update maintained as locally as possible
- Accessible through web-based interface
- Built to provide a minimum set of attributes
- Overseen by national land parcel coordinator, working with coordinators for
 - Federal lands (federal land parcel coordinator)
 - Indian lands
 - State coordinators (in each state).

Coordinators would insure national data consistency and work with the Census Bureau and other departments to create accurate boundaries and identifiers

National land parcel data would serve as cadastral framework data layer for the National Spatial Data Infrastructure. Data would also:

- Be placed and remain in the public domain
- Contain no information about private ownership, use or value
- Use the parcel as the fundamental, unique and cellular land records element
- Be maintained by local government officials
- Contain the following attributes:

⁴ National Land Parcel Data, National Academies Press, 2006

- unique identifier
- street address
- generalized category of ownership
- FGDC compliant metadata

The national vision emphatically asserts that it is not intended as any sort of replacement for existing property record systems. It also indicates that intermediate alternatives to polygonal parcels could be constructively pursued en route to full-blown parcel development. While it remains to be seen whether such a point or centroid based intermediate program is appropriate to the needs of Maine, it has been effective in other states (including New York).

Funding of such a program is viewed as a shared responsibility among all stakeholders. The federal government would bear responsibility for integrating data across boundaries, including not merely state boundaries but levels of government within a state as well. Various sources of high-quality imagery will be funded to provide support context for parcel data automation.

It is anticipated that local governments with existing parcel programs would retain current licensing privileges and receive new funding to cover costs of data sharing.

4-4. COMPARATIVE STATE EXPERIENCES

Integrated property parcel data at the state level are not the norm in the United States. But significant work is currently being undertaken in this area and a number of states are committed to completing unified digital parcel data within their borders in the near future.

Significant study has gone into evaluating state level parcel systems. The FGDC Subcommittee for Cadastral Data has inventoried state systems as recently as 2005. Those studies and updated findings provide interesting benchmarks for such systems and how they might pertain to Maine's experience. Some of these findings include:

- Nineteen states have converted more than 80% of their parcels to digital format
- 2,389 US counties (75%) do not have digital parcel data
- South Carolina, West Virginia and New Hampshire are estimated to have only 10% of their parcels converted
- All states but Alaska distribute responsibility for collecting parcel data to local (comprising both county and municipal) governments
- Twelve states centrally manage parcel data; eight centrally manage geometry
- The number of entities responsible for collecting parcel data varies considerably, with Maine at or close to the top of the list as depicted in Table 3-1.

Table 3-1: Comparative State Parcel Maintenance Burden

State	# of Entities Responsible
New Jersey	566
Maine	500+
Massachusetts	351
Vermont	253
Texas	253
Delaware , Hawaii	<10

At least eight states are currently working to integrate or develop parcel data at an integrated statewide level. For some this involvement amounts to creating and subsidizing a parcel standard, while in others (e.g., Montana) the actual parcel boundary data is being maintained for the bulk of local jurisdictions. Table 3-2 summarizes status of these initiatives.⁵

⁵ State comparison tables and data are modified from Stage/von Meyer, 2006

Table 3-2: Status of Statewide Parcel Data Integration

	Maine	Alabama	Arkansas	Florida	Montana	North		
						Carolina	Tennessee	Wisconsin
Population (millions)	1,317,200	4,500,000	2,693,000	16,000,000	900,000	8,050,000	5,700,000	5,400,000
Area (sq mi)	33,414	50,750	52,100	53,927	145,552	48,000	41,219	54,310
Parcels (total in state)	760,000	2,600,000	20,016,500	9,000,000	1,000,000	4,421,000	3,600,000	3,500,000
Density (people/sqmile)	39.4	88.7	51.7	296.7	6.2	167.7	138.3	99.4
Persons per parcel	1.7	1.7	1.3	1.8	0.9	1.8	1.6	1.5
Average parcel size (acres)	22.7	12.5	16.5	3.8	93.2	7.0	7.3	9.9
Program begin date		2000	2002	1998	1997	1976	2000	1989
Program end date		2008	2008	2005	2003	2000	ongoing	ongoing
Percent converted at program start		UNK	UNK	48%	10%	0%	0%	UNK
Current state of conversion		60%	10%	99%	99%	95%	40%	83%
Cost share (state/county/other)		75% -25%	UNK	75% -25%	75% -25%	UNK	75% -25%	30% -70%
Funding source		agency, legislature, cooperative	agency, cooperative	agency, legislature, cooperative	agency, legislature, cooperative, recording fee	cooperative, recording fee	agency, legislature, cooperative	recording fee, cooperative
Managing agency	GeoLibrary	DOR	DOR/GIS	DOR	DOR/GIS	State	Commerce / Comptroller	Commerce / Comptroller
Centrally manage data		YES	YES	YES	YES	YES	YES	NO
Centrally compile data		YES	YES	YES	YES	NO	NO	NO
Central database		YES	YES	YES	YES	NO	NO	NO
Counties (total)	16	67	75	67	56	100	95	72
Counties (participating)	16	67	73	67	48	100	30	72

Arkansas maintains a geospatial data clearinghouse that includes parcels, though these are not nearly complete statewide. The GeoStor system provides consolidated hosting services for interactive web mapping. Local, state and federal agencies may store, publish and distribute their parcels and other layers through this system.

Montana provides an intergovernmental collaborative program that produces and maintains parcel information in a consistent format for the entire state. This system provides the foundation for the Montana Department of Revenue mass appraisal system and coordinates parcel development throughout the state

North Carolina provides an example of how state government can behave as an intermediary between local providers and the user community. Each participating data provider stores and controls releases of and access to its own parcel data. This is a more likely potential model for Maine distribution and maintenance, even while it is county-implemented rather than managed to the municipal level.

Tennessee Division of Property Assessments operates a statewide computer-assisted tax billing system and a long range program for periodic re-appraisal of locally assessed property. As part of this program the state creates and maintains county-level parcel data to “ensure county-level parcel data are accurate and current so assessing officials can correctly locate boundaries and related information.”

The Province of New Brunswick, Canada, is another state-equivalent system that merits consideration in this study partly because it is an immediate neighbor to Maine and partly because of the excellence of the system. New Brunswick was the first provincial (or state)

organization in North America to provide province-wide web-based property mapping, valuation, and registry-related data to its customers. Launched more than 10 years ago, this smoothly operating system manages more than 550,000 parcels for a population of 730,000 in an area roughly the size of Maine. The New Brunswick Land Registry encompasses 15 counties and 13 registry offices and registers over 108,000 documents annually. This includes more than 3,200 plans.

In the New Brunswick system, all parcels of land were mapped and converted to digital format by the late 1990's. Each parcel was assigned a Parcel Identifier (PID), which is the key to access both the digital map as well as attribute data. Digital maps are updated on a daily basis with new parcels created by registered documents or plans.

In the New Brunswick system, legislative amendments were necessary (2001) to establish the PID as the legal description key for the property. This legal framework is an essential step toward moving digital parcel data into a central role in land ownership and transfer.

In 2006 a project was begun to scan all historical documents (prior to 2002) for all registry offices. By end of year (2008) this project will be completed, having scanned and indexed more than 13 million total pages.

Ultimately New Brunswick is aiming toward implementation of a complete Torrens title system, by which title is guaranteed by the state to the property described and to those included in the register.

4-5. GENERAL BENEFITS OF MAINE INTEGRATED LAND RECORDS⁶

Tier 2 users, including active land records data consumers and potential high-benefit lands records data users, can significantly benefit from a future Maine ILRIS. As digital parcels are essential to a broad swath of municipal departments, so too are they critical to a broad spectrum of state agencies. From Conservation, Environmental Protection, Health and Agriculture to Transportation, Economic Development and Planning, there is practically no end to the applications for digital parcels.

Among regional planning agencies, non-government organizations such as The Nature Conservancy and Audubon Society, and private firms concentrating on land-based activities, they are also singularly valuable. A large number of federal agencies also maintain keen interest in these data. Contributing to this study, representatives from the US Environmental Protection Agency, the Department of Homeland Security, US Department of Agriculture, National Geospatial-Intelligence Agency, National Oceanic and Atmospheric Administration, Centers for Disease Control, US Fish & Wildlife Service, the Census Bureau and others have expressed explicit interest in these data.

Significant benefits stand to be gained from accessible, accurate and dependable integrated land records data in Maine. Some of these which have proven themselves out to different user categories follow.

Benefits to Local Governments

- Assures that the best available data are used in each public transaction
- Avoids conflicts among land records of different public offices
- Improves accuracy of real property assessments
- Provides base maps for local governance across multiple departments
- Encourages coordination among various data users through common mapping framework
- Improves public attitudes toward administration of local government by making the process appear more transparent to the public
- Reduces traffic flow into offices thereby allowing staff to concentrate their efforts on more value added services
- Accelerates land-centric searches and transactions and provides geographic context and “intelligence of place”

Benefits to State Government

- Provides definitive record of “envelope” of and abutters to Department of Transportation activities;
- Provides accurate inventories of natural assets to DEP, DOC and other environmental agencies
- Provides accurate location references for administration of Health, Public Utilities, and other regulatory agencies

⁶ Some benefits components are compiled from Procedures and Standards for a Multipurpose Cadastre (NRC, 1983)

- Accurately locates State ownership or interests in land
- Provides standardized database for public lands management
- Simplifies coordination among State and local offices
- Provides a database for monitoring objects of state concern, e.g. agricultural land use, development patterns adjacent to sensitive resources, or out-of-state ownership of Maine real estate
- Benefits comprehensive planning initiatives fundamentally by producing a common operating picture of land ownership and rights

Benefits to Federal Government

- Provides a flow of standardized data for updating federal maps and statistics
- Provides a database for monitoring objects of national concern, e.g., border configurations, use or foreign ownership of US real estate, inventories of vulnerable properties in areas prone to natural disasters
- Provides standardized records for managing federal assistance to local programs such as housing, community development and historic preservation

Benefits to Non-government and Commercial Entities

- Produces accurate inventories of land parcels and makes these freely available as true public records
- Formalizes accurate inventories of land parcels and makes these freely available as true public records
- Makes possible standard, high-accuracy maps that can be used for planning, engineering or economic development studies and initiatives
- Speeds up and assures compliance with governmental regulations
- Saves cost, effort and time in assessing siting considerations and the geography associated with permitting questions

Benefits to Individuals

- Provides faster and more dependable access for records impacting individual rights, especially land title
- Clarifies boundaries of areas restricted by zoning, wetland restrictions, pollution controls or natural hazard impacts
- Produces accurate maps that can be used for resolving private interests in land
- Improves efficiency of tax-supported government services
- Saves cost, effort and travel time in answering land ownership and property configuration questions
- Improves transparency of government, property rights, land access and regulatory specifics

4-6. STAKEHOLDER INVENTORIES

A large number of stakeholders stand to benefit by access to integrated and available land records data resources. These beneficiaries are not restricted to current data owners who do not have graphical access to their data (such as municipal assessors) but extend to state and federal agencies, land trusts, regional planning agencies, surveyors, assessors, appraisers, individual land owners and a multitude of commercial interests who can use these data in combination with other resources to add value to their business models.

An inventory of beneficiaries of an ILRIS is provided below.

Tier 1 – Data producers:

- Municipalities (assessing and property maintenance departments)
- County Registries
- MRS/LURC

Tier 2 – Core data consumers:

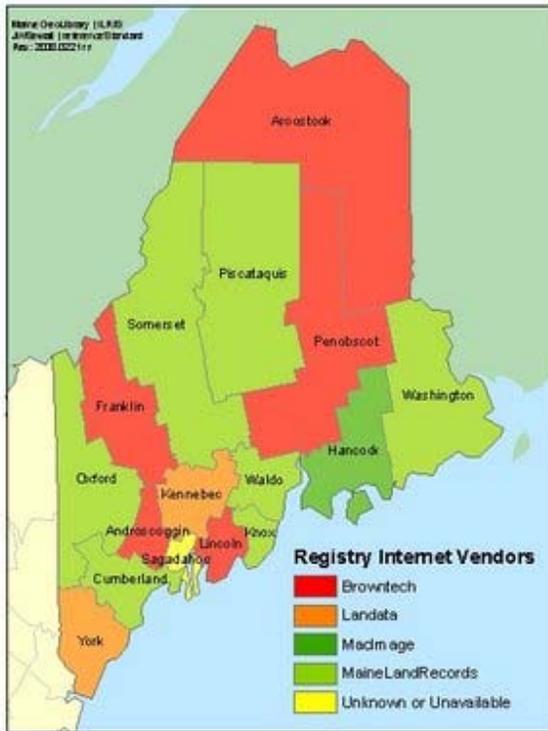
- Municipalities (outside of property maintenance departments)
- State agencies
- Federal agencies
- Non-government organizations: land trusts, regional planning agencies, etc.
- Private entities: title companies, developers, law firms, etc.
- NGOs: land trusts, regional planning agencies, etc.
- Individual property owners

Tier 3 – Technical facilitators:

- Surveyors: There are more than 675 surveyors listed as current members of the Maine Society of Land Surveyors⁷
- Registry web vendors: Currently four different vendors serve Deeds Registries in providing access to digital records via the internet. These include:
 - Browntech
 - Landata
 - Maclmage
 - MaineLand Records / ACS
- Future integration of land records to the registry level will necessarily involve agreements of one form or another with these vendors to maintain continuity of access.

⁷ link: <http://www.msls.org/members.php>

Figure 5-1: Registry Web Vendor Areas of Coverage



- Mapping + GIS companies:
Some of the mapping companies listed in Table 5-1 are no longer operational, but are editors-of-record in the list maintained by MRS. This is due to the fact that some of Maine's towns have not had map updates since the early 1970's. A small number of the listed firms (e.g., Aerial Survey & Photo, Sewall) are the identified parcel mapping firms for the vast bulk of the approximately 470 tracked municipalities.

Table 5-1: Mapping Companies Serving Maine Municipalities

Mapping Companies Serving Maine Municipalities	
45 North Cartographic	Laurence Amazeen
Acme Engineering & Design Inc.	Lee Doody
Aerial Survey & Photo, Inc.	Linda Alverson
Andrews & Lane Inc.	Michael Malesky
Austin Engineering	John Cahoon
Avis Air Maps	John Miller Eastern Mapping
Bridgham Engineering & Surveying Inc.	N.K.R. Planning Commission - Harold Dowse
C.K. Archer	NMDC
Cartographics	Northeast Forest Engineering
Central Maine Surveying	O'Donnell & Associates
CES	Patton Associates
CMC Associates	Paul Herrick
Coffin	Photoscience/Kappa Mapping
Coolong	Plisca & Day
Deslauriers	Portland Eng.
Dickey/Coolong	Prentiss & Carlisle Co.
Dirigo Forest Management	R.D. Scott
Donald Burhe	Raynold Holmes
Eastern Mapping Service	Richard Buxton
Elgin Turner	Sackett & Brake Survey, Inc.
Ernest Lewis	Sage Collins
Forrest Smart Surveyor	Scott Appraisal
GEO Systems	Seven Islands Land Company
GIS Mapping & Analysis	SLF, Inc.
GIS Solutions	Smart
Griffiths	Spatial Alternatives
Hamlin Associates, Inc.	Tarr Assessing Services
Hatfield Randall Associates	Town Engineer
Herbert Dickey	U.S. Army Corps. Of Eng.
Herrick & Salisbury	W B Hamlin
Hillier & Associates	Webber Surveying
In-House	Woodard & Curran and GIS Mapping & Analysis
JW Sewall Co.	Wright-Pierce

Figure 5-2: Revaluation Companies Serving Maine Municipalities

Revaluation Companies Serving Maine Municipalities	
ABC Assessors	Lona LaFrancis
Assessor (in house) & Mark Gibson	Lowe
Bell Assoc	Maine Assessment & Appraisal Services, Inc.
Bernard Williams	Maine Equalization Consultants
Board of Assessors	Marion Anderson
Board of Assessors & Murphy Appraisal Services	Mark J Gibson
Bowdoin Associates	Matthew E. Sturgis, CMA
Brenda (Hunnewell) Gove	Mayo/Cook
Brenda Gove	MBA Assessing
Brenda Hunnewell	ME Equalization Consultants
Carl Lowe	Meadow Brook Consulting
Carroll Willette	Merwin Welch
CLT	Michael Noble
CMC Assoc	MMC Inc
D & B Assessing	Murphy Appraisal Services, Inc.
D. Guy	Nancy Sprague
Dead River company	Nyberg - Purvis
Dickey Appraisal Services	O'Donnell & Associates
Edward Cyr	Parker Appraisal
Emerton	Partridge
Eugene A. Huskins	Patriot Properties
Garnet Robinson	Patten Appraisals
Gary Blanchette	Penquis Real Estate Services
Geaghan & Assoc.	Phillips & McGillicuddy
Gerald E. Daigle, CMA	Pleasant Ridge Plt. Board of Assessors
Gerald Thurlow	R.J.D. Appraisal
Gibson	Randy Tarr
Gove	RE-Tarr Appraisal/PP-Patton Appraisal
H. Dickey of Dickey Appraisal	Richard Main
Hamlin Associates, Inc	RJD Appraisal
Herbert Dickey	Robbins
Hunnewell	Robert B. Stevens
In house CMA	Robt Gingras/Parker Appraisal
In House	Roger Peppard
In House and Hamlin Assoc. on Commercial	Ruth E Birtz CMA
In House by Kevin McGillicuddy, CMA	Samson - Stevens
In House w/ Comm Consultant	Samson/Garrity
In House/Property Valuation Advisors	Sandra Hebert
In house-Ruth E. Birtz CMA	Scott Appraisal
Independent Appraisal	Selectmen/Assessors Per Tarr Assessing Services
J Douglas Guy CMA	Stanley Barrows
J. W. Sewall Co.	Tarr Associates
Jackie Robbins	Thompson
James A Phillips	Town
James Jurdak	Tyler Technology/Cole Layer Trumble
Joan Janeski	United Appraisal
John E O'Donnell & Assoc.	Van Tuinen
Kevin McGillicuddy	Vexman consulting
Knox Town Assessors	Vision Appraisal Technology
LaFrancis	W-3 Associates
Local Assessors	White Church Associates
	Whiteley

Revaluation companies, responsible for property appraisal across the State, are another stakeholder group that stands to benefit from the adoption of an ILRIS in Maine. A number of the firms listed in Table 5-2 utilize these data where they are available, but lack of dependable digital parcel data for many Maine municipalities adds significant cost to the revaluation process. Recent revaluations in towns with fewer than 2,500 parcels have cost upwards of \$125,000 to deliver.

- National and Regional Commercial Land Records Vendors

A number of firms in the private sector are actively creating parcel data sets. These data are essential to applications that require accurate geographic location for addressing properties and those that require detailed attributes about the ownership, use and value of properties. There is a robust market for each of these application areas, and a sample of some of the more prominent representatives of these vendors is listed in Table 5-3⁸.

Table 5-3: Sampling of National and Regional Commercial Land Records Vendors

Company	Product	Data Type
<i>improved address location and navigation firms</i>		
Navteq	Parcelboundaries	polygons
TeleAtlas	Address Points	points
First American	parcelPoint	points, polygons
GDR	Addresspoints	points
<i>parcel information and boundaries supply firms</i>		
Boundary Solutions	National Parcel Portal	polygons
ParcelQuest	ParcelQuest	polygons
Sidwell Maps	Digital Tax Maps	polygons
eMaps Plus	Digital Tax Maps	points
<i>land records and sales data firms</i>		
The Warren Group	RE Record Search	tables, points, polygons

A SPECIAL NOTE OF THANKS

The Strategic Planning and Integrated Land Records team of the GeoLibrary is grateful for all of the participation at interviews and forums throughout this data collection process by scores of individuals representing the full spectrum of public and private stakeholders inside and out of State.

A full list of these participants is available as an appendix to this document.

⁸ Table modified and enhanced from National Land Parcel Data, NRC, 2007

GLOSSARY OF TERMS

Assessor	Property tax assessing officer; municipal official responsible for fair and equitable assessment for property tax purposes
Attribute	Data in a table attached to or associated with an object describing parcel geometry
Blog	Weblog; ILRIS project weblog was maintained at: http://maineplan.blogspot.com
Book and page	An alphanumeric reference number combination assigned by county Deeds Registers to uniquely identify recorded documents within a county jurisdiction
CADD	Computer aided design and drafting; also AutoCAD; primary digital mapping technology utilized by surveyor and architectural professions
Centralized repository	Single location where official set of digital parcel data records are stored
Certified plans	Property survey plans that have been recorded by and stored in a county deeds registries and have been certified by a registered surveyor
Classified Lands	Properties classified as and assessed at current use status and required to be designated on the RETT form; these classifications include Tree Growth, Farmland, Open Space and Working Waterfront parcels
Conceptual Framework	Subcomponent of Integrated Land Records Plan; provides overview of project structure, components and stakeholders
Data automation	Conversion of hardcopy-based information do digital formats
Deed	Legal document establishing and defining ownership of real property
DEP	Department of Environmental Protection
DOT	Department of Transportation
Easement	A non-possessionary interest to use real property in possession of another person for a stated purpose; relative to parcel maps and data, typically a fractional area of a parcel that carries usage but not ownership rights
Edge matching	Joining features from separate maps (ie, parcels from adjoining towns) so as to produce smooth transitions.
ESRI	Environmental Systems Research Institute; dominant GIS software vendor
FGDC	Federal Geographic Data Committee;
Functional Specification	Subcomponent of Integrated Land Records Plan
Geocode	Apply geographic information to a data or document to give it a known location on a map
GeoLibrary	Maine Library of Geographic Information
Georeference	To orient (a scanned image, aerial photograph, etc) so as to match features for which geographic coordinates are known
Geospatial data	Data containing geographic information (geometry) that is directly referenced to actual locations on the earth
GIS Service Center	Location where users can access technical, hardware and software support for geographic information system assistance
LRIS key	Identifier applied to parcels intended to identify them uniquely in place and time
LURC	Land Use Regulation Commission
Map block lot	Identifier traditionally assigned by assessors to uniquely name property parcels within a single municipality
MEGIS	Maine Office of Geographic Information Systems
MEGUG	Maine GIS Users Group
MRS	Maine Revenue Services (Property Tax Division)
MSLS	Maine Society of Land Surveyors
Municipalities	Maine organized towns and cities using or with the potential to use GIS technology; see: http://www.editgrid.com/user/rs1618/ME_ILRIS_ParcelStatus
OGC	Open GIS Consortium; non-profit international, voluntary organization that develops and maintains standards for geospatial and location based services
OIT	Office of Information Technology
Open source	Software (primarily) that is available to be used without paying licensing fees; maintained collaboratively by users through shared editing and enhancement
Orthoimagery	Aerial images, familiar to many users through such software as Google Earth or Microsoft Live Local, that have been technically adjusted to remove distortion and knitted together to form a continuous map
Parcel	Smallest non-dividable section of land
Parcel grants	Monies distributed from the Maine GeoLibrary in order to encourage or permit municipalities to develop or modify their data holdings to meet state standards

Parcel standard	The Maine State GIS Parcel Standard (rev 2005); see: http://www.maine.gov/geolib/parcelgrants.htm
Perpetual maintenance	Ongoing, dynamic maintenance, as opposed to static
PLSS	Public Land Survey System; a method used in the United States to survey and identify land parcels, particularly for titles and deeds of rural, wild or undeveloped land; typically divides land into 6-mile-square townships, which is the level of information included in the National Atlas. Townships are subdivided into 36 one-mile-square sections. Sections can be further subdivided into quarter sections, quarter-quarter sections, or irregular government lots. Normally, a permanent monument, or marker, is placed at each section corner
PostgreSQL/PostGIS	Open source database management system; PostGIS provides geospatial data storage and tools available in an open source, unlicensed (free) environment
Projection	Mathematical transformation that allows real world geographic data (from a round globe) to be displayed accurately on a flat surface
Promotional Plan	Subcomponent of Integrated Land Records Plan
PUC	Maine Public Utilities Commission
Raster	Digital geographic data in image formats, such as aerial photographs (as opposed to Vector)
Recorded plans	Survey plans that have been recorded and are stored in a county deeds registry; not necessarily certified
Registry of deeds	County offices responsible for maintenance of ownership records;
Registry web vendors	Private companies who distribute county registry data (deeds, plans, etc) through web browser interfaces; includes Browntech, Landata, MacImage, MaineLandRecords/ACS, etc. Most vendors also provide desktop interfaces to county clients from within the Registries
RETT	Real estate transfer tax; <i>digital</i> RETT refers to the ongoing efforts of the MRS to streamline this process by making this a web-based reporting action rather than a paper-based one
Shape file	ESRI geographic data standard data format
Spatial relationship	Data relationships based on location; associating information from proximity (rather than through shared data values in different tables)
SPO	State Planning Office
Survey	Document establishing boundaries of ownership of a given property
Torrens title system	A system of land title where a register of land holdings maintained by the state or proxy guarantees an indefeasible title to those included in the register;
Tree growth program	Maine state program for encouraging tree growth and forestry on parcels > 10 acres
USGS	United States Geological Survey
USM	University of Southern Maine; typically refers to the GIS Lab at USM
UT	Unorganized territory; comprising townships in the northern and western part of Maine; approximately 10 million acres and 27,000 parcels
Vector	Digital data comprising features which behave like objects (i.e., points, lines, polygons); (as opposed to Raster)
Vision	One of the major CAMA companies providing services to both counties and municipalities in Maine; see: http://www.visionappraisal.com/databases/maine/index.htm
Zoning	A device of land use regulation used by local governments to designate permitted uses of land based on delineated zones;

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MUNICIPALITY	CNTY	Parcels in Tree Growth	Parcels in Farmland Protection	Parcels in Open Space Protection	Parcels in Working Waterfront	Tax Maps	MapDate	MapContractor	GeoLib	Tax Map Medium	Parcel Count	Taxable Acres
ABBOT	PISC	56	0	1	0	Y	1973	JW Sewall Co.		PAPER	902	20,673
ACTON	YORK	36	5	2	0	Y	1976	JW Sewall Co.		PAPER	2,917	
ADDISON	WASH	51	5	9	0	Y	4/1/1992	Aerial Survey and Photo		PAPER	1,312	25,963
ALBION	KENN	55	5	0	0	Y	1991	Aerial Survey and Photo	PC	PAPER	1,209	25,285
ALEXANDER	WASH	20	0	2	0	Y				PAPER	665	21,740
ALFRED	YORK	62	9	0	0	Y		Eastern Mapping Service		PAPER	1,697	
ALLAGASH	AROO	9	0	0	0	Y	6/1/1978	JW Sewall Co.		PAPER	366	77,974
ALNA	LINC	95	4	0	0	Y	4/1/1975	JE O'Donnell and Associates	PC	PAPER	660	12,446
ALTON	PENO	18	0	0	0	Y	4/1/1988	Forrest Smart Surveyor		PAPER	617	26,554
AMHERST	HANC	54	0	0	0	Y	4/1/100	Eastern Mapping Service	MC	PAPER	328	24,352
AMITY	AROO	50	0	0	0	Y	4/1/1979	JW Sewall Co.		PAPER	344	26,154
ANDOVER	OXFO	137	0	0	0	Y	1976	JW Sewall Co.		PAPER	942	366,567
ANSON	SOME	105	30	0	0	Y	4/1/1985	JW Sewall Co.	Y	GIS	1,833	29,611
APPLETON	KNOX	51	37	15	0	KY	1977	Donald Burhe		PAPER	1,066	18,550
ARROWSIC	SAGA	4	0	1	0	Y	4/1/1998	Aerial Survey and Photo	Y	GIS-PAPER		3,578
ARUNDEL	YORK	20	20	3	0	Y	4/1/1972	JE O'Donnell and Associates		PAPER	2,043	14,399
ASHLAND	AROO	0	0	0	0	Y	1979	JW Sewall Co.		PAPER		
ATHENS	SOME	125	8	0	0	Y	1972	JW Sewall Co.	PC	PAPER	934	26,647
ATKINSON	PISC	64	0	16	0	Y	4/1/1985	Forrest Smart		PAPER	354	23,824
AUBURN	ANDR	36	32	7	0	Y	4/1/2000	JW Sewall Co.	Y	GIS	9429	36,145
AUGUSTA	KENN	81	9	0	0	Y	1955	JW Sewall Co.	MC	GIS	8,356	33,127
AURORA	HANC	42	0	0	0	Y	4/1/01	Eastern Mapping Service	MC	PAPER	205	24,076
AVON	FRAN	98	0	0	0	Y	1975	JE O'Donnell and Associates		PAPER	556	26,195
BAILEYVILLE	WASH	17	0	0	0	Y	7/1/1975	JW Sewall Co.		PAPER	1,093	15,752
BALDWIN	CUMB	62	4	0	0	Y	1970	JE O'Donnell and Associates		PAPER	865	19,263
BANCROFT	AROO	29	0	0	0	Y		Central Maine Surveying	MC	CAD-PAPER	201	25,608
BANGOR	PENO	31	12	0	0	Y	Unknown	Unknown		PAPER	11,345	19,589
BAR HARBOR	HANC	61	0	0	0	Y	4/1/05	Photoscience/Kappa Mapping	MC	GIS	3,433	27,777
BARING PLT	WASH	5	0	4	0	Y	1/1/1979	JW Sewall Co.		PAPER	205	1,847
BATH	SAGA	9	9	3	0	Y	4/1/1994	Cartographics	Y	GIS	3,705	4,348
BEALS	WASH	1	0	2	0	Y	4/10/05	John Miller Eastern Mapping	MC	PAPER		1,934
BEAVER COVE	PISC	17	0	0	0	Y	4/1/1975	JW Sewall Co.		PAPER	325	20,288
BEDDINGTON	WASH	39	0	0	0	Y					424	
BELFAST	WALD	38	29	11	0	Y	4/1/1956	Wright-Pierce		PAPER	3,800	18,275
BELGRADE	KENN	108	5	4	0	Y	4/1/1968	JW Sewall Co.	MC	GIS-PAPER	2,859	24,883
BELMONT	WALD	6	0	0	0	Y	1978	JE O'Donnell and Associates		PAPER		9,035
BENTON	KENN	67	82	1	0	Y	1/1975	JW Sewall Co.	PC	PAPER	1,626	19,168
BERWICK	YORK	48	32	2	0	Y	4/1/1979	JE O'Donnell and Associates		PAPER	3,067	21,980
BETHEL	OXFO	155	2	0	0	Y	4/1987	Aerial Survey and Photo	Y	GIS-PAPER	2,697	39,810
BIDDEFORD	YORK	30	25	11	0	Y	4/1/1964	JW Sewall Co.	Y	GIS-PAPER	7,788	14,805
BINGHAM	SOME	0	0	0	0	Y		JE O'Donnell and Associates	PC	PAPER	786	
BLAINE	AROO	4	0	0	0	Y	4/1/1974	JW Sewall Co.		PAPER		11,960
BLUE HILL	HANC	90	20	9	0	Y	4/1/1990	Sage Collins		PAPER	2,239	38,229
BOOTHBAY	LINC	46	2	0	0	Y	5/8/05	Wright-Pierce	MC	PAPER	3,457	13,865
BOOTHBAY HARBOR	LINC	11	1	1	0	Y	4/1/1967	JW Sewall Co.	PC	PAPER	2,218	3,350
BOWDOIN	SAGA	64	25	0	0	Y	4/1/1974	JE O'Donnell and Associates	Y	GIS-PAPER	1,546	25,053
BOWDOINHAM	SAGA	63	51	20	0	Y	4/1/07	Spatial Alternatives	MC	CAD	1,495	19,017
BOWERBANK	PISC	4	0	0	0	N					552	27,832
BRADFORD	PENO	95	5	0	0	Y	4/1/1977	JW Sewall Co.		PAPER	847	24,579
BRADLEY	PENO	22	0	0	0	Y	4/1/1994	JW Sewall Co.		PAPER	759	19,559
BREMEN	LINC	70	1	9	3	Y	5/18/05	JW Sewall Co.	MC	PAPER	917	11,500
BREWER	PENO	3	1	0	0	Y	1946	JW Sewall Co.	MC	CAD-GIS	3,843	7,862
BRIDGEWATER	AROO	28	0	0	0	Y	1/1/1975	JW Sewall Co.		PAPER	521	23,571
BRIDGTON	CUMB	129	3	2	0				Y	GIS		
BRIGHTON PLT	SOME	53	0	0	0	Y	1988	W B Hamlin	PC	PAPER	209	25,200
BRISTOL	LINC	32	5	15	10	Y	4/1/1957	JW Sewall Co.	PC	PAPER	3,590	22,120
BROOKLIN	HANC	17	14	3	0	Y	4/1/1974	JW Sewall Co.		PAPER	1,259	10,981
BROOKS	WALD	19	0	0	0	Y	1993	JW Sewall Co.		PAPER	731	14,552
BROOKSVILLE	HANC	44	30	31	1	Y	4/1/1987	JW Sewall Co.	Y	GIS-PAPER	1,259	18,626
BROWNFIELD	OXFO	147	2	0	0	Y	1974	JE O'Donnell and Associates		PAPER	1,480	23,600
BROWNVILLE	PISC	121	0	0	0	Y	5/28/05	JW Sewall Co.	MC	PAPER	1,185	22,173
BRUNSWICK	CUMB	24	42	79	0	Y	4/1/1956	Wright-Pierce		GIS	7,187	22,443
BUCKFIELD	OXFO	76	11	6	0	Y	1976	Avis Air Map		PAPER	1,282	5,344
BUCKSPORT	HANC	98	15	1	0	Y	4/1/1975	JW Sewall Co.		PAPER	2,975	31,176
BURLINGTON	PENO	63	0	0	0	Y	1997	Elgin Turner		PAPER	621	34,000
BURNHAM	WALD	75	14	0	0	Y	1972	JW Sewall Co.		PAPER	1,035	24,330
BUXTON	YORK	35	0	0	0	Y	9/1/1953	JW Sewall Co.		PAPER	3,694	24,807
BYRON	OXFO	28	1	23	0	N					278	32,503
CALAIS	WASH	123	1	0	0	Y	1972	JW Sewall Co.	MC	CAD	2,345	24,677
CAMBRIDGE	SOME	30	6	0	0	Y	Unknown	N.K.R. Planning Commission - Haro	PC	PAPER	471	11,921
CAMDEN	KNOX	27	8	9	0	Y	4/1/1997	Cartographics	MC	GIS	3,035	6,897
CANAAN	SOME	69	1	0	0	Y	2/1/1979	Central Maine Surveying	PC	PAPER	1,438	24,700
CANTON	OXFO	68	26	5	0	Y	1978	JE O'Donnell and Associates		PAPER	876	17,750

CAPE ELIZABETH	CUMB	56	4	7	0	Y	1/1/1956	Wright-Pierce	Y	GIS	4,309	9,048
CARATUNK	SOME	10	0	0	0	Y	5/30/05	SLF Inc	MC	PAPER		34,000
CARIBOU	AROO	8	2	0	0	Y	1958	JW Sewall Co.		PAPER	4,279	
CARMEL	PENO	56	6	0	0	Y	Unknown	JW Sewall Co.		PAPER	1,506	22,450
CARRABASSETT VALLEY	FRAN	7	18	0	0	N					3,006	42,981
CARROLL PLT	PENO	82	0	0	0	Y	1979	JW Sewall Co.		PAPER	389	28,409
CARTHAGE	FRAN	71	0	1	0	N					466	20,191
CARY PLT	AROO	23	0	0	0	Y	4/9/1976	Northeast Forest Engineering	MC	CAD	308	9,620
CASCO	CUMB	56	9	0	0	Y	4/1/19666	JW Sewall Co.	Y	CAD-GIS	2,814	2,875
CASTINE	HANC	20	3	11	0	Y	4/1/1973	JW Sewall Co.		PAPER	774	4,151
CASTLE HILL	AROO	26	5	0	0	Y	1/1/1973	JW Sewall Co.	Y	GIS-PAPER	292	15,595
CASWELL	AROO	2	0	0	0	Y	1979	SLF Inc		PAPER	262	10,531
CHAPMAN	AROO	39	5	0	0	Y	1/1/1977	JW Sewall Co.	Y	GIS-PAPER	336	16,590
CHARLESTON	PENO	216	0	6	0	Y	4/1/1975	JW Sewall Co.		PAPER	858	24,870
CHARLOTTE	WASH	26	0	0	0	Y	3/7/1990	Eastern Mapping Service		PAPER	473	17,310
CHEBEAGUE ISLAND	CUMB	7	2	6	1	Y	4/1/1958	Wright-Pierce		PAPER	707	1,835
CHELSEA	KENN	5	0	0	0	Y	5/26/1973	JW Sewall Co.	PC	PAPER	1,382	10,420
CHERRYFIELD	WASH	40	0	5	0	Y				PAPER	1,089	
CHESTER	PENO	33	0	0	0	Y	1976	Prentiss and Carlisle		PAPER	459	29,349
CHESTERVILLE	FRAN	38	0	85	0	Y	4/1972	JE O'Donnell and Associates		PAPER	1,242	24,698
CHINA	KENN	47	12	2	0	Y	4/1/1998	JW Sewall Co.	Y	CAD-GIS	3,442	29,788
CLIFTON	PENO	71	0	0	0	Y	4/1/1992	Eastern Mapping Service	Y	GIS-PAPER	652	20,219
CLINTON	KENN	138	63	2	0	y	1/1975	JW Sewall Co.	PC	PAPER	1,819	26,709
CODYVILLE PLT	WASH											
COLUMBIA	WASH	64	0	2	0	Y	4/1/1996	JW Sewall Co.	MC	PAPER		
COLUMBIA FALLS	WASH	38	3	2	0	Y	1979	SLF Inc		PAPER	554	13,430
COOPER	WASH	30	0	2	0	Y	1/4/1999	Eastern Mapping Service	MC	PAPER	334	18,618
COPLIN PLT	FRAN	7	2	1	0	Y	4/1/1996	Griffiths	MC	PAPER	338	19,942
CORINNA	PENO	47	81	0	0	Y	4/1/07	JW Sewall Co.	MC	PAPER	1,417	23,782
CORINTH	PENO	58	3	0	0	Y	4/1/1986	JW Sewall Co.		PAPER	1,525	24,741
CORNISH	YORK	66	5	5	0	Y	1/1/1974	JE O'Donnell and Associates		PAPER	966	14,496
CORNVILLE	SOME	87	0	0	0	Y	4/1/1999	Laurence Amazeen	MC	PAPER	867	26,062
CRANBERRY ISLES	HANC	0	0	2	0	Y	4/1/1975	JW Sewall Co.		PAPER		
CRAWFORD	WASH	6	0	0	0	Y	1978			PAPER	71	20,555
CRYSTAL	AROO	67	0	5	0	Y	1978	Andrews and Lane		PAPER	315	24,355
CUMBERLAND	CUMB	50	26	4	0	Y	4/1/1958	Wright-Pierce	Y	GIS	3,105	8,165
CUSHING	KNOX	25	2	4	1	Y	4/1/1971	JE O'Donnell and Associates		PAPER	1,304	11,471
CUTLER	WASH	19	0	0	0	Y	1980	SLF Inc		PAPER	642	?
CYR PLT	AROO	16	0	0	0	Y	5/25/1905	JW Sewall Co.			191	
DALLAS PLT	FRAN	23	1	1	0	Y	4/1979	JW Sewall Co.		PAPER	698	?
DAMARISCOTTA	LINC	21	4	2	1	Y	1965	JW Sewall Co.	PC	PAPER	1,344	6,671
DANFORTH	WASH	52	0	0	0	Y	4/1/1975	JW Sewall Co.		PAPER	862	30,668
DAYTON	YORK	1	68	0	0	Y	1/1/1992	JW Sewall Co.		PAPER	880	10,634
DEBLOIS	WASH	0	0	1	0	Y				PAPER		
DEDHAM	HANC	57	3	0	0	Y	1980	SLF Inc		PAPER	2,600	23,277
DEER ISLE	HANC	49	1	5	0	Y	1/19/1978	JW Sewall Co.		PAPER	2,263	15,550
DENMARK	OXFO	154	1	12	0	Y	4/1/1974	JE O'Donnell and Associates	Y	GIS-PAPER	1,686	28,807
DENNISTOWN PLT	SOME	4	0	1	0	Y	1976	JW Sewall Co.	PC	PAPER	50	23,631
DENNYVILLE	WASH	0	0	0	0	Y				PAPER		
DETROIT	SOME	4	0	0	0	Y	4/1991	Eastern Mapping Service	PC	PAPER	595	12,553
DEXTER	PENO	93	44	0	0	Y	6/4/05	Webber Surveying	MC	CAD-PAPER	2,416	15,288
DIXFIELD	OXFO	181	2	1	0	Y	4/1/1956	JW Sewall Co.		PAPER	1,559	28,829
DIXMONT	PENO	37	0	0	0	Y	1/1/1979	SLF Inc		PAPER	937	21,807
DOVER-FOXCROFT	PISC	131	12	0	0	Y	4/1/1957	JW Sewall Co.	Y	GIS-PAPER	3,132	39,770
DRESDEN	LINC	35	25	0	0	Y	1997	JE O'Donnell and Associates	PC	PAPER	1,167	17,190
DREW PLT	PENO	27	0	0	0	Y	N/A	Central Maine Surveying		PAPER	103	19,304
DURHAM	ANDR	54	8	0	0	Y	4/1/1975	JE O'Donnell and Associates		PAPER	2,008	23,649
DYER BROOK	AROO	9	0	0	0	Y	4/1978	SLF Inc		PAPER	255	14,433
EAGLE LAKE	AROO	29	0	0	0	Y	4/1/1978	STF Inc.		PAPER	894	
EAST MACHIAS	WASH	36	0	1	0	Y	6/15/00	JW Sewall Co.	MC	PAPER	1,227	20,663
EAST MILLINOCKET	PENO	1	0	0	0	Y	1/1998	Sackett & Brake Survey, Inc.	MC	PAPER	846	5,760
EASTBROOK	HANC	17	0	1	0	Y	1990	Aerial Survey and Photo		PAPER	786	5,186
EASTON	AROO	20	0	0	0	Y	1986	JW Sewall Co.		PAPER	1,014	24,375
EASTPORT	WASH	8	0	5	0	Y	1935	U.S. Army Corps. Of Eng.		PAPER	1,677	
EDDINGTON	PENO	27	0	0	0	Y			MC	CAD-PAPER	1,174	12,649
EDGECOMB	LINC	27	1	0	0	Y	7/1/1972	JE O'Donnell and Associates	PC	PAPER	1,025	
EDINBURG	PENO	13	0	0	0	Y	2006	JW Sewall Co.		PAPER	147	21,320
ELIOT	YORK	16	37	0	0	Y		JW Sewall Co.		PAPER	3,076	11,400
ELLSWORTH	HANC	237	18	2	0	Y	4/1/1988	JW Sewall Co.	Y	GIS	5,300	49,179
EMBDEN	SOME	43	2	0	0	Y	8/20/07	Dirigo Forrest Management	MC	PAPER	1,371	23,691
ENFIELD	PENO	46	2	3	0	Y	4/1/1973	JW Sewall Co.		PAPER	1,369	16,650
ETNA	PENO	34	0	0	0	Y	4/1/1979	SLF Inc		PAPER	747	15,174
EUSTIS	FRAN	20	0	0	0	Y	3/1/1976	JE O'Donnell and Associates		PAPER	956	25,134
EXETER	PENO	55	164	9	0	Y	4/1/1993	Plisca & Day	MC	CAD	780	23,738
FAIRFIELD	SOME	124	64	0	0	Y	1962	JW Sewall Co.	PC	PAPER	2,980	28,000
FALMOUTH	CUMB	56	12	3	0	Y	4/1/1955	Wright-Pierce	Y	GIS	5,185	14,100
FARMINGDALE	KENN	1	0	0	0	Y	1972	JW Sewall Co.	PC	PAPER	424	7,300

FARMINGTON	FRAN	109	75	2	0	Y	4/1/1968	JE O'Donnell and Associates		PAPER	3,400	52
FAYETTE	KENN	98	4	4	0	Y	4/1/1974	JE O'Donnell and Associates	PC	PAPER	1,507	18,070
FORT FAIRFIELD	AROO	16	0	0	0	Y	4/12/1961	JW Sewall Co.		PAPER	2,077	44,450
FORT KENT	AROO	43	0	0	0	Y	5/1/1980	John Cahoon	Y	GIS-PAPER	2,302	35,654
FRANKFORT	WALD	38	0	0	0	Y	4/1/1975	JW Sewall Co.		PAPER	965	
FRANKLIN	HANC	19	0	8	0	Y	4/1/1984	Aerial Survey and Photo		PAPER	1,518	21,719
FREEDOM	WALD	25	17	0	0	Y	4/1/1979	SLF Inc		PAPER	568	13,776
FREEPORT	CUMB	126	11	27	0	Y	4/1/1954	JW Sewall Co.	Y	GIS	4,183	12,100
FRENCHBORO	HANC	1	0	4	0	N					118	1,829
FRENCHVILLE	AROO	1	0	0	0	Y	1970	JW Sewall Co.		PAPER	987	16,830
FRIENDSHIP	KNOX	43	2	15	5	Y	4/1/07	Aerial Survey and Photo	Y	GIS-PAPER	1,210	8,404
FRYE ISLAND	CUMB	0	0	0	0	N					952	460
FRYEBURG	OXFO	203	61	1	0	Y	1975	JE O'Donnell and Associates		PAPER	3,025	35,000
GARDINER	KENN	11	0	0	0	Y	4/1/1964	JW Sewall Co.	PC	PAPER	2,662	8,555
GARFIELD PLT	AROO	12	0	0	0	Y	3/5/02	Prentiss and Carlisle	MC	PAPER	96	10,084
GARLAND	PENO	57	15	0	0	Y	1970	JW Sewall Co.		PAPER	944	20,550
GEORGETOWN	SAGA	11	1	30	0	Y	1974	JE O'Donnell and Associates	PC	PAPER	1,375	12,000
GILEAD	OXFO	0	0	0	0							
GLENBURN	PENO	21	0	0	0	Y	4/1/1990	JW Sewall Co.		PAPER	2,099	16,219
GLENWOOD PLT	AROO	14	0	0	0	Y	10/1978	Andrews and Lane		PAPER	61	23,994
GORHAM	CUMB	114	20	15	0	Y	4/1/1958	JW Sewall Co.	Y	CAD-GIS-PAPER	6,627	31,936
GOULDSBORO	HANC	26	1	6	0	Y	4/1/1978	JW Sewall Co.		PAPER	2,321	27,152
GRAND ISLE	AROO	19	0	0	0	Y	1/4/1976	JW Sewall Co.		PAPER		
GRAND LAKE STRM PLT	WASH	10	0	0	0	Y	1972	JW Sewall Co.		PAPER	252	26,767
GRAY	CUMB	61	24	0	0	Y	1954/1997	Wright-Pierce	Y	GIS	4,454	
GREAT POND	HANC	19	0	0	0	Y	8/11/1994	JW Sewall Co.		PAPER	129	23,175
GREENBUSH	PENO	99	0	1	0	Y	1974	JW Sewall Co.		PAPER	1,101	29,053
GREENE	ANDR	14	9	11	0	Y	4/1/1969	JW Sewall Co.		PAPER	2,167	18,684
GREENVILLE	PISC	74	2	1	0	Y	4/1/1954	JW Sewall Co.		PAPER	2,146	25,777
GREENWOOD	OXFO	162	1	0	0	Y	4/1/1974	JE O'Donnell and Associates		PAPER	1,053	25,987
GUILFORD	PISC	89	3	0	0	Y	1976	JW Sewall Co.		PAPER	1,062	20,600
HALLOWELL	KENN	5	0	2	0	Y	1/1979	JW Sewall Co.	PC	PAPER	1,180	3,375
HAMLIN	AROO	3	0	0	0	Y	4/1/1975	JW Sewall Co.		PAPER	267	14,000
HAMMOND	AROO	5	0	0	0	Y	1978	Hilfield Randall Assoc.		PAPER	112	25,075
HAMPDEN	PENO	15	7	1	0	Y	5/22/05	JW Sewall Co.	MC	GIS	3,522	21,427
HANCOCK	HANC	33	0	1	0	Y	4/1/1977	Herrick & Salsbury		PAPER	1,761	17,787
HANOVER	OXFO	10	0	0	0	Y	4/07	JE O'Donnell and Associates	MC	PAPER	321	4,250
HARMONY	SOME	63	1	0	0	Y	4/1/1979	Paul Herrick	PC	PAPER	939	
HARPSWELL	CUMB	50	2	17	1	Y	4/1/07	Aerial Survey and Photo	MC	GIS-PAPER	4,880	12,767
HARRINGTON	WASH	5		10	0	Y						
HARRISON	CUMB	113	15	4	0	Y	1972	JE O'Donnell and Associates	Y	GIS-PAPER	2,455	23,385
HARTFORD	OXFO	170	7	0	0	Y	4/1/1978	JE O'Donnell and Associates		PAPER	1,028	22,000
HARTLAND	SOME	49	0	1	0	Y	1996	Hamlin and Associates	PC	PAPER	1,650	24,059
HAYNESVILLE	AROO	33	0	0	0	Y	4/1/1976	JW Sewall Co.		PAPER	181	26,902
HEBRON	OXFO	41	0	0	0	Y	4/1/1968	JE O'Donnell and Associates		PAPER	787	12,500
HERMON	PENO	14	10	0	0	Y	4/1/05	JW Sewall Co.	Y	GIS	2,753	21,164
HERSEY	AROO	6	0	0	0	Y	4/1/01	Sackett & Brake Survey, Inc.	MC	PAPER	110	25,540
HIGHLAND PLT	SOME	13	0	0	0	Y	3/1/03	Michael Malesky	MC	PAPER	85	25,957
HIRAM	OXFO	104	35	0	0	Y	4/1/1976	JE O'Donnell and Associates		PAPER	1,386	22,342
HODGDON	AROO	48	1	3	0	Y	4/7/1975	JW Sewall Co.		PAPER	805	16,185
HOLDEN	PENO	14	0	0	0	Y	1973	SLF Inc	MC	GIS-PAPER	2,131	19,000
HOLLIS	YORK	169	0	156	0	Y	6/30/1995	JW Sewall Co.	MC	PAPER	2,265	20,600
HOPE	KNOX	41	75	2	0	Y	4/1/07	Aerial Survey and Photo	MC	GIS	1,170	13,509
HOULTON	AROO	15	17	0	0	Y	4/1/1968	JW Sewall Co.	MC	GIS	2,983	19,977
HOWLAND	PENO	45	0	0	0	Y	7/1974	Prentiss and Carlisle		PAPER	707	
HUDSON	PENO	39	0	0	0	Y	4/1975	JW Sewall Co.		PAPER	1,073	24,613
INDUSTRY	FRAN	71	0	0	0	Y	5/28/05	Acme Engineering	MC	PAPER	893	18,500
ISLAND FALLS	AROO	17	0	0	0	Y	4/1982	JW Sewall Co.		PAPER	1,020	979
ISLE AU HAUT	KNOX	8	0	2	0	Y					180	3,976
ISLESBORO	WALD	14	0	31	0	Y	4/1/06	Aerial Survey and Photo	Y	GIS	1,193	7,914
JACKMAN	SOME	21	0	0	0	Y	5/1/1980	SLF Inc	PC	PAPER	820	24,122
JACKSON	WALD	23	20	0	0	Y	2004	Spatial Alternatives	Y	GIS-PAPER	481	
JAY	FRAN	61	21	1	0	Y	4/1/1970	JW Sewall Co.		PAPER	2,846	30,720
JEFFERSON	LINC	0	14	11	0	Y	1975	JW Sewall Co.	PC	PAPER	3	14,698
JONESBORO	WASH	47	0	3	0	Y				PAPER		
JONESPORT	WASH	13	8	2	0	N					1,504	14,358
KENDUSKEAG	PENO	24	0	0	0	Y	1975	JW Sewall Co.		PAPER	600	10,191
KENNEBUNK	YORK	27	42	22	0	Y	4/1/1958	GEO Systems	MC	GIS	6,055	21,200
KENNEBUNKPORT	YORK	18	8	4	0	Y	4/1/1974	Avis Air Map		PAPER	3,454	12,378
KINGFIELD	FRAN	65	35	0	0	N					988	26,096
KINGSBURY PLT	PISC	37	0	0	0	Y	4/1/1979	JW Sewall Co.		PAPER	228	28,279
KITTERY	YORK	8	3	0	0	Y	1960	JW Sewall Co.	Y	GIS-PAPER	4,470	53,568
KNOX	WALD	18	115	0	0	Y					543	16,095
LAGRANGE	PENO	450	0	0	0	Y	8/1/1989	Hamlin and Associates		PAPER	634	29,211
LAKE VIEW PLT	PISC	24	0	0	0	Y	4/1/00	JW Sewall Co.	MC	PAPER	525	25,200
LAKEVILLE	PENO	182		1	0	Y	9/1994	CMC Associates		PAPER	692	23,566

LAMOINE	HANC	10	1	0	0	Y	4/1/1974	JW Sewall Co.		PAPER	1,359	10,912
LEBANON	YORK	92	0	0	0	Y		JE O'Donnell and Associates		PAPER	3,061	33,379
LEE	PENO	110	9	16	0	Y	4/1/1976	JW Sewall Co.		PAPER	1,041	22,002
LEEDS	ANDR	17	28	2	0	Y	4/1/1968	JW Sewall Co.		PAPER	1,451	23,824
LEVANT	PENO	24	39	0	0	Y	4/1/1970	JW Sewall Co.	Y	CAD-GIS	1,231	18,472
LEWISTON	ANDR	7	7	0	0	Y	1/1999	JW Sewall Co.	MC	GIS-PAPER	11,474	20,192
LIBERTY	WALD	14	2	0	0	Y	1978	JW Sewall Co.		PAPER	1,122	15,261
LIMERICK	YORK	25	6	0	0	Y	1977	JE O'Donnell and Associates		PAPER	2,042	16,108
LIMESTONE	AROO	3	0	0	0	Y	4/1/1958	JW Sewall Co.		PAPER	1,053	19,556
LIMINGTON	YORK	96	7	0	0	Y	5/1969	JE O'Donnell and Associates		PAPER	2,098	25,000
LINCOLN	PENO	105	5	0	0	Y	1950	JW Sewall Co.		PAPER	3,768	46,067
LINCOLN PLT	OXFO	5	0	0	0	N					99	21,607
LINCOLNVILLE	WALD	55	35	17	0	Y	4/1/00	Aerial Survey and Photo	MC	PAPER	2,150	17,374
LINNEUS	AROO	277	0	0	0	Y	1976	JW Sewall Co.		PAPER	977	28,160
LISBON	ANDR	94	22	7	0	Y	4/1/1962	Wright-Pierce		PAPER	3,555	14,717
LITCHFIELD	KENN	80	0	33	0	Y	4/1/1970	JE O'Donnell and Associates	MC	PAPER	2,230	21,447
LITTLETON	AROO	15	0	0	0	Y	5/1/1975	Hatfield Randall Associates		PAPER	701	23,040
LIVERMORE	ANDR	58	0	0	0	Y	4/1/1979	JE O'Donnell and Associates		PAPER	1,702	32,770
LIVERMORE FALLS	ANDR	53	15	0	0	Y	1974	JW Sewall Co.		PAPER	1,557	11,511
LONG ISLAND	CUMB	1	0	2	0	Y	1926	Portland Eng.	MC	GIS-PAPER	680	629
LOVELL	OXFO	95	0	9	0	Y			Y	GIS	1,708	24,166
LOWELL	PENO	59	0	0	0	Y	4/1/04	JW Sewall Co.	MC	PAPER	563	22,684
LUBEC	WASH	54	1	27	0	Y	4/1/1958	JW Sewall Co.		PAPER	1,876	21,594
LUDLOW	AROO	34	0	0	0	Y	4/1/1974	Hatfield Randall Associates		PAPER	345	
LYMAN	YORK	24	16	7	0	Y	4/1/1972	JW Sewall Co.	Y	GIS	2,532	21,945
MACHIAS	WASH	26	2	1	0	Y	1970	JW Sewall Co.		PAPER		
MACHIASPORT	WASH	28	7	4	0	Y	4/1/1987	Aerial Survey and Photo		PAPER	1,146	10,650
MACWAHOC PLT	AROO	18	0	0	0	Y	1978	JW Sewall Co.		PAPER		
MADAWASKA	AROO	17	3	0	0	Y	1971	JW Sewall Co.	Y	GIS-PAPER	3,079	32,413
MADISON	SOME	134	138	14	0	Y	4/1/1972	JW Sewall Co.	MC	CAD-GIS-PAPER	2,762	33,500
MAGALLOWAY PLT	OXFO	3	0	0	0	N						
MANCHESTER	KENN	9	1	3	0	Y	1962	Wright-Pierce	PC	PAPER	1,483	11,713
MAPLETON	AROO	7	1	0	0	Y	1/1/1972	JW Sewall Co.	Y	GIS-PAPER	1,190	20,625
MARIAVILLE	HANC	55	0	0	0	Y	4/1/1987	JE O'Donnell and Associates	Y	GIS-PAPER	749	28,914
MARS HILL	AROO	16	12	0	0	Y	1989	Scott Appraisal		PAPER	968	23,017
MARSHFIELD	WASH	14	0	0	0	Y		JW Sewall Co.				
MASARDIS	AROO	11	0	0	0	Y	4/30/1973	JW Sewall Co.		PAPER		
MATINICUS ISLE PLT	KNOX	0	0	0	0							
MATTAWAMKEAG	PENO	94	2	0	0	Y	1981	Patton Associates		PAPER	671	48,071
MAXFIELD	PENO	15	0	0	0	Y	1/1/1992	JW Sewall Co.		PAPER	139	11,803
MECHANIC FALLS	ANDR	20	2	0	0	Y	1984	Aerial Survey and Photo		PAPER	1,439	7,427
MEDDYBEMPS	WASH	17	0	0	0	Y				PAPER		
MEDFORD	PISC	71	0	0	0	Y	6/19/1987	Hamlin and Associates		PAPER	342	27,006
MEDWAY	PENO	46	0	0	0	Y	7/1/1979	JW Sewall Co.		PAPER	917	23,507
MERCER	SOME	76	3	0	0	Y	5/30/05	SLF Inc	MC	PAPER	680	16,643
MERRILL	AROO	29	0	0	0	Y	1995	Herbert Dickey of Dickey Appraisal		PAPER		
MEXICO	OXFO	25	0	5	0	Y	?	JE O'Donnell and Associates		PAPER	1,556	?
MILBRIDGE	WASH	58	5	17	0	Y	1/6/1962	JW Sewall Co.		PAPER	1,567	
MILFORD	PENO	43	0	0	0	Y	4/1/1975	JW Sewall Co.		PAPER	1,410	17,263
MILLINOCKET	PENO	4	0	0	0	Y	3/1/1995	Coolong		PAPER	2,503	9,861
MILO	PISC	98	0	1	0	Y	1966	JW Sewall Co.		PAPER	1,699	20,044
MINOT	ANDR	133	48	0	0	Y	1979	JE O'Donnell and Associates		PAPER	1,407	
MONHEGAN PLT	LINC					Y	1976	Ernest Lewis	PC	PAPER	386	511
MONMOUTH	KENN	23	32	4	0	Y	4/1/1993	Aerial Survey and Photo	PC	PAPER	2,711	19,606
MONROE	WALD	6	105	0	0	Y	1/1/07	45 North Cartographic	MC	GIS	728	723
MONSON	PISC	109	0	9	0	Y	4/1/07	Hamlin and Associates	MC	PAPER	998	
MONTICELLO	AROO	23	0	0	0	Y	3/19/07	Bridgham Engineering	MC	PAPER	700	22,852
MONTVILLE	WALD	45	72	24	0	Y	9/1/1980	Austin Engineering		PAPER	1,080	23,343
MOOSE RIVER	SOME	6	0	0	0	Y			PC		207	25,720
MORO PLT	AROO	4	0	0	0	Y	4/1/04	Sackett & Brake Survey, Inc.	MC	PAPER	140	22,870
MORRILL	WALD	17	6	1	0	Y	5/1991	JW Sewall Co.		PAPER	572	
MOSCOW	SOME	24	0	0	0	Y	4/1/1966	JE O'Donnell and Associates	PC	PAPER	522	29,274
MOUNT CHASE	PENO	82	0	1	0	Y	4/1/06	Tarr Assessing Services	MC	PAPER		22,269
MOUNT DESERT	HANC	10	4	0	0	Y	4/1/1968	JE O'Donnell and Associates		PAPER	2,575	
MOUNT VERNON	KENN	111	20	3	0	Y	4/1/1964	Wright-Pierce	PC	PAPER	1,630	22,544
NAPLES	CUMB	76	0	3	0	Y	4/1/1968	JE O'Donnell and Associates		PAPER	3,566	20,000
NASHVILLE PLT	AROO	1	1	1	0	Y	8/1/1996	Seven Islands Land Company	MC	PAPER	48	22,008
NEW CANADA	AROO	8	0	0	0	Y	3/1/1976	JW Sewall Co.		PAPER	Ukn	Ukn
NEW GLOUCESTER	CUMB	155	49	18	0	Y	1/1/1966	JW Sewall Co.	Y	GIS-PAPER	2,780	27,295
NEW LIMERICK	AROO	8	0	0	0	Y		Hatfield Randall Associates		PAPER	634	11,693
NEW PORTLAND	SOME	163	0	0	0	Y	1977	SLF Inc	PC	PAPER	1,100	25,400
NEW SHARON	FRAN	117	2	2	0	Y	7/1/1993	Aerial Survey and Photo		PAPER	1,250	29,966
NEW SWEDEN	AROO	14	0	0	0	Y	3/3/03	Bridgham Engineering	MC	PAPER	534	19,770
NEW VINEYARD	FRAN	71	0	1	0	Y				PAPER		
NEWBURGH	PENO	32	0	0	0	Y	Unknown	Eastern Mapping Service		PAPER	931	22,054
NEWCASTLE	LINC	154	12	1	0	N			PC	PAPER	1,469	16,275

NEWFIELD	YORK	52	2	1	0	Y	4/1/1977	JE O'Donnell and Associates		PAPER	1,760	12,273
NEWPORT	PENO	44	15	6	0	Y	4/1/1975	JW Sewall Co.		PAPER	2,067	17,238
NEWRY	OXFO	83	0	0	0	Y	4/1/1976	JE O'Donnell and Associates		PAPER		
NOBLEBORO	LINC	7	24	3	0	Y	1/1/1997	JW Sewall Co.	MC	PAPER	1,523	13,940
NORRIDGEWOCK	SOME	110	10	8	0	Y	4/1/1970	Sackett & Brake Survey, Inc.	PC	PAPER	2,041	31,206
NORTH BERWICK	YORK	72	8	1	0	Y	1970	JW Sewall Co.		PAPER	2,326	22,510
NORTH HAVEN	KNOX	4	0	14	0	Y	4/1/1974	JW Sewall Co.	MC	GIS-PAPER	627	6,400
NORTH YARMOUTH	CUMB	7	1	0	0	Y	1981	JE O'Donnell and Associates	Y	GIS-PAPER	1,773	12,070
NORTHFIELD	WASH	30	0	3	0	Y					441	
NORTHPORT	WALD	11	11	2	0	Y	4/1/1974	JE O'Donnell and Associates		PAPER	1,565	13,363
NORWAY	OXFO	79	13	0	0	Y	4/1/1954	JW Sewall Co.	MC	GIS-PAPER	3,035	27,251
OAKFIELD	AROO	55	0	0	0	Y	4/1/1979	JW Sewall Co.		PAPER		
OAKLAND	KENN	45	6	1	0	Y		JW Sewall Co.	PC	PAPER	3,800	15,000
OGUNQUIT	YORK	6	0	1	0	Y	4/1/1979	JW Sewall Co.	Y	GIS-PAPER	1,120	1,877
OLD ORCHARD BEACH	YORK	13	1	0	0	Y	4/1/1973	Avis Air Map	MC	GIS-PAPER	4,382	3,871
OLD TOWN	PENO	21	1	0	0	Y	5/9/05	JW Sewall Co.	MC	CAD-PAPER	3,148	15,182
ORIENT	AROO	16	0	0	0	Y	4/1/1976	JW Sewall Co.		PAPER	408	22,315
ORLAND	HANC	71	11	0	0	Y	5/30/1972	JW Sewall Co.		PAPER	1,952	29,158
ORONO	PENO	33	6	0	0	Y	4/1/02	JW Sewall Co.	MC	CAD-GIS	2,330	12,700
ORRINGTON	PENO	29	6	0	0	Y	1/1/1972	JW Sewall Co.	MC	GIS-PAPER	1,975	15,041
OSBORN	HANC	11	0	0	0	N					120	21,626
OTIS	HANC	54	0	0	0	Y	4/1/1979	JE O'Donnell and Associates		PAPER	949	13,500
OTISFIELD	OXFO	94	2	6	0	Y	1969	JE O'Donnell and Associates		PAPER	1,781	23,334
OWLS HEAD	KNOX	3	0	4	0	Y	4/1/1980	Aerial Survey and Photo		PAPER	1,251	4,387
OXBOW PLT	AROO	8	0	0	0	Y	3/1/01	Linda Alverson	MC	PAPER	143	22,732
OXFORD	OXFO	88	1	5	0	Y	4/1/1970	JE O'Donnell and Associates	Y	GIS-PAPER	2,672	Unk
PALERMO	WALD	30	3	1	0	Y	1/5/00	C.K. Archer	MC	PAPER	1,300	1,278
PALMYRA	SOME	26	51	1	0	Y	4/1/1975	JW Sewall Co.	PC	PAPER	1,295	24,414
PARIS	OXFO	127	10	9	0	Y	5/1/1966	JE O'Donnell and Associates	Y	GIS-PAPER	2,672	25,144
PARKMAN	PISC	146	0	0	0	Y	1979	JW Sewall Co.		PAPER	924	27,666
PARSONSFIELD	YORK	103	2	0	0	Y	1970	JE O'Donnell and Associates		PAPER	1,627	36,814
PASSADUMKEAG	PENO	22	0	0	0	Y	1976	JW Sewall Co.		PAPER	412	11,600
PATTEN	PENO	66	0	0	0	Y	4/1/1977	JE O'Donnell and Associates		PAPER	734	22,290
PEMBROKE	WASH	34	0	7	0	Y				PAPER		
PENOBSCOT	HANC	34	3	3	0	Y	4/1/1984	JW Sewall Co.		PAPER	1,225	Unk
PERHAM	AROO	51	1	2	0	Y	1977	JW Sewall Co.		PAPER	403	23,171
PERRY	WASH	31	0	2	0	Y		JW Sewall Co.		PAPER	976	
PERU	OXFO	103	0	0	0	Y	1972	JW Sewall Co.		PAPER		
PHILLIPS	FRAN	154	0	0	0	Y	4/1/1975	JE O'Donnell and Associates		PAPER	1,037	
PHIPPSBURG	SAGA	32	1	4	1	Y	4/1/04	Spatial Alternatives	Y	GIS	2,084	12,699
PITTSFIELD	SOME	47	16	2	0	Y	4/1/1977	SLF Inc	PC		2,172	27,641
PITTSTON	KENN	25	6	6	0	Y	4/1/1980	JE O'Donnell and Associates	PC	PAPER	1,607	5,104
PLEASANT RIDGE PLT	SOME	16	0	0	0	Y	1970	JW Sewall Co.	PC	PAPER	138	13,442
PLYMOUTH	PENO	39	0	0	0	Y		SLF Inc		PAPER	847	17,612
POLAND	ANDR	75	13	0	0	Y	Unk	JW Sewall Co.		PAPER	3,040	24,923
PORTAGE LAKE	AROO	12	0	0	0	Y	1970	JW Sewall Co.		PAPER		14,282
PORTER	OXFO	119	4	0	0	Y	1973	JE O'Donnell and Associates		PAPER	1,226	19,660
PORTLAND	CUMB	3	1	23	0	Y	1/1/06	In-House	MC	GIS-PAPER	22,500	13,900
POWNAL	CUMB	0	0	1	0	Y	4/1/1974	JE O'Donnell and Associates		PAPER	755	12,450
PRESQUE ISLE	AROO	13	0	0	0	Y	4/1/1991	Aerial Survey and Photo		PAPER	4,412	43,051
PRINCETON	WASH	32	0	0	0	Y	1/1/1991	Aerial Survey and Photo		PAPER	655	23,004
PROSPECT	WALD	12	0	0	0	Y	4/1/1998	JW Sewall Co.	MC	PAPER	614	11,464
RANDOLPH	KENN	0	0	0	0	Y	10/9/1976	JE O'Donnell and Associates	PC	PAPER	732	1,085
RANGELEY	FRAN	27	1	5	0	Y	1965	JW Sewall Co.		PAPER	2,304	24,507
RANGELEY PLT	FRAN	83	0	1	0	Y						
RAYMOND	CUMB	51	2	2	0	Y	1968	JW Sewall Co.	Y	GIS	3,543	20,400
READFIELD	KENN	83	20	3	0	Y	4/1/06	Hillier & Associates	Y	GIS-PAPER	1,707	17,416
REED PLT	AROO	15	0	0	0	Y	4/1/1976	Central Maine Surveying		PAPER	228	35,422
RICHMOND	SAGA	33	13	18	0	Y	5/30/05	JE O'Donnell and Associates	Y	GIS-PAPER	1,826	18,285
RIPLEY	SOME	29	17	4	0	Y	2003	Hamlin and Associates	PC	PAPER	592	
ROBBINSON	WASH	42	0	0	0	Y	6/1/02	Herbert Dickey of Dickey Appraisal	MC	CAD	658	
ROCKLAND	KNOX	18	0	7	0	Y	1/1/01	Photo Science	MC	GIS	3,575	5,739
ROCKPORT	KNOX	12	19	20	0	Y	4/1/04	Aerial Survey and Photo	Y	GIS	2,348	
ROME	KENN	30	0	14	0	Y	1978	JW Sewall Co.	PC	PAPER	1,721	12,603
ROQUE BLUFFS	WASH	8	0	0	0	Y	4/1/1999	JW Sewall Co.	MC	PAPER	599	6,253
ROXBURY	OXFO	61	2	5	0	Y	1983	Sackett & Brake Survey, Inc.		PAPER	607	27,800
RUMFORD	OXFO	253	0	29	0	Y	8/1/05	Aerial Survey and Photo	Y	GIS-PAPER	3,187	
SABATTUS	ANDR	21	25	2	0	Y	4/1/07	JE O'Donnell and Associates	MC	PAPER	2,417	15,508
SACO	YORK	74	63	16	0	Y	1967	JW Sewall Co.	Y	GIS	7,907	19,532
SAINT AGATHA	AROO	9	0	0	0	Y	4/1/1978	John Cahoon		PAPER		
SAINT ALBANS	SOME	50	0	1	0	Y	6/11/1989	Aerial Survey and Photo	PC		1,835	26,482
SAINT FRANCIS	AROO		0			Y	1972	JW Sewall Co.		PAPER		
SAINT GEORGE	KNOX	25	4	15	2	Y	4/1/07	Aerial Survey and Photo	MC	CAD	2,698	14,854
SAINT JOHN PLT	AROO	5	0	0	0	Y	1975	JW Sewall Co.		PAPER	297	30,000
SANDY RIVER PLT	FRAN	18	0	0	0	N					592	18,557
SANFORD	YORK	111	5	0	0	Y	1954	Town Engineer	MC	GIS-PAPER	9,235	31,202

SANGERVILLE	PISC	0	0	0	0	Y	4/1/07	Hamlin and Associates	MC	PAPER	1,240	
SCARBOROUGH	CUMB	57	8	12	0	Y	4/1/1998	Deslauriers	MC	GIS	8,110	23,648
SEARSMONT	WALD	119	9	1	0	Y	2/1980	Raynold Holmes	Y	GIS-PAPER	1,205	22,968
SEARSPORT	WALD	12	3	3	0	Y	4/1/07	JW Sewall Co.	Y	CAD-GIS	1,441	16,160
SEBAGO	CUMB	106	4	3	0	Y	4/1/1973	JW Sewall Co.		PAPER	2,103	32,000
SEBEC	PISC	75	0	0	0	Y	4/1/1985	Smart		PAPER	679	22,894
SEBOEIS PLT	PENO	4	0	0	0	N					156	23,405
SEDGWICK	HANC	35	5	11	0	Y	4/1/1977	JW Sewall Co.		PAPER	1,178	16,307
SHAPLEIGH	YORK	0	0	6	0	Y	1972	JW Sewall Co.		PAPER		
SHERMAN	AROO	51	1	1	0	Y	1983	R.D. Scott		PAPER	624	22,092
SHIRLEY	PISC	23	0	0	0	Y	5/29/1976	JW Sewall Co.		PAPER	376	
SIDNEY	KENN	24	28	1	0	Y	1998	JE O'Donnell and Associates	PC	PAPER	1,975	2,300
SKOWHEGAN	SOME	88	85	4	0	Y	1/1/1955	JW Sewall Co.	Y	GIS-PAPER	4,157	39,680
SMITHFIELD	SOME	72	2	0	0	Y	7/1/1977	SLF Inc	PC	PAPER	947	12,038
SMYRNA	AROO	22	0	0	0	Y	1995	Herbert Dickey of Dickey Appraisal		PAPER		
SOLOON	SOME	246	0	5	0	Y	1/1/1977	Acme Engineering	PC	PAPER	1,066	31,972
SOMERVILLE	LINC	17	0	1	0	N			PC			
SORRENTO	HANC	5	0	0	0	Y	4/1/1975	JW Sewall Co.		PAPER	446	2,714
SOUTH BERWICK	YORK	68	12	1	0	Y	1/1/1978	JW Sewall Co.	Y	GIS-PAPER	3,388	6,900
SOUTH BRISTOL	LINC	17	0	3	0	Y	1977	JW Sewall Co.	PC	PAPER	1,300	8,400
SOUTH PORTLAND	CUMB	0	2	0	0	Y	2007	Woodard & Curran and GIS Mapping	Y	GIS	8,720	4,640
SOUTH THOMASTON	KNOX	9	8	0	1	Y	6/29/1980	Aerial Survey and Photo		PAPER	1,235	6,489
SOUTHPORT	LINC	0	0	1	4	Y	4/1/1976	JW Sewall Co.	PC	PAPER	1,200	
SOUTHWEST HARBOR	HANC	19	2	3	0	Y	4/1/1956	JW Sewall Co.		PAPER	1,504	3,814
SPRINGFIELD	PENO	140	0	0	0	Y	1978	JW Sewall Co.		PAPER	555	24,092
STACYVILLE	PENO	9	0	0	0	Y	4/30/1998	Northeast Forest Engineering	MC	PAPER	367	25,555
STANDISH	CUMB	166	1	1	0	Y	4/1/02	GIS Solutions (Jim Thomas)	Y	GIS-PAPER	5,146	32,000
STARKS	SOME	95	0	0	0	N			PC		669	19,518
STETSON	PENO	42	10	0	0	Y	1/1/1976	JE O'Donnell and Associates		PAPER	962	21,805
STEUBEN	WASH	23	4	6	3	Y	1/1/07	Eastern Mapping Service	MC	PAPER	1,564	29,373
STOCKHOLM	AROO	11	0	0	0	Y	9/18/02	CES	MC	PAPER	261	21,635
STOCKTON SPRINGS	WALD	19	0	2	0	Y	1992	JW Sewall Co.	MC	GIS-PAPER		11,313
STONEHAM	OXFO	15	0	3	0	Y	1973	JE O'Donnell and Associates		PAPER	526	8,176
STONINGTON	HANC	22	0	6	0	Y	4/1/1970	Richard Buxton		PAPER		
STOW	OXFO	67	0	0	0	Y	1974	JE O'Donnell and Associates		PAPER	510	
STRONG	FRAN	50	0	0	0	Y	4/1/1976	Acme Engineering		PAPER	873	17,228
SULLIVAN	HANC	55	1	1	0	Y	1974	JW Sewall Co.		PAPER		
SUMNER	OXFO	158	8	2	0	Y	10/1/1994	JE O'Donnell and Associates		PAPER		
SURRY	HANC	93	15	8	0	Y	4/1/1978	JW Sewall Co.		PAPER	1,576	23,837
SWANS ISLAND	HANC	26	0	6	0	Y	2001	Eastern Surveying Co		PAPER	845	6,809
SWANVILLE	WALD	12	14	2	0	Y	1980	JW Sewall Co.		PAPER	1,288	
SWEDEN	OXFO	75	1	0	0	Y	1972	JE O'Donnell and Associates	Y	GIS-PAPER	633	17,500
TALMADGE	WASH	2	0	0	0	N					77	22,852
TEMPLE	FRAN	91	0	0	0	Y	1976	Acme Engineering		PAPER	599	22,637
THE FORKS PLT	SOME	3	0	1	0	Y	9/1976	SLF Inc	PC	PAPER	464	457
THOMASTON	KNOX	6	16	4	0	Y	4/1/02	Aerial Survey and Photo	MC	GIS-PAPER	1,500	69,281
THORNDIKE	WALD	22	21	0	0	Y	2006	Spatial Alternatives	Y	GIS-PAPER	642	14,872
TOPSFIELD	WASH	26	0	0	0	Y	4/1/1997	Dickey/Coolong	MC	PAPER	242	27,762
TOPSHAM	SAGA	101	56	1	0	Y	1/1/1957	Wright-Pierce	Y	CAD-GIS	3,642	17,198
TREMONT	HANC	4	0	10	0	Y	4/1/01	Aerial Survey and Photo	MC	PAPER	1,533	7,388
TRENTON	HANC	32	3	4	0	Y	4/1/07	JW Sewall Co.	MC	PAPER	1,261	11,325
TROY	WALD	114	51	0	0	Y	4/1/1978	JW Sewall Co.		PAPER	961	22,284
TURNER	ANDR	24	17	0	0	Y	4/1/02	JW Sewall Co.	Y	GIS-PAPER	3,140	34,084
UNION	KNOX	28	50	10	0	N	Unk	JW Sewall Co.		PAPER	1,575	19,162
UNITY	WALD	48	0	0	0	Y	1979	SLF Inc	Y	GIS-PAPER	1,154	23,715
UPTON	OXFO	22	0	0	0	Y	3/1/1982	JE O'Donnell and Associates		PAPER	379	20,677
VAN BUREN	AROO	32	0	0	0	Y	2004	NMDC		PAPER	5,700	
VANCEBORO	WASH	6	0	0	0	Y	1980	A & L		PAPER	106	
VASSALBORO	KENN	139	30	6	0	Y	1/1/1956	JW Sewall Co.	PC	PAPER	2,493	25,917
VEAZIE	PENO	2	0	0	0	Y	1989	JW Sewall Co.	MC	CAD-GIS	698	
VERONA	HANC	1	0	6	0	Y	4/1/1983	W B Hamlin	Y	GIS-PAPER	432	3,804
VIENNA	KENN	31	2	0	0	Y			PC	PAPER		
VINALHAVEN	KNOX	46	1	1	4	Y	2005	In-House	MC	GIS	1,855	12,637
WADE	AROO	20	0	0	0	Y	6/30/1977	JW Sewall Co.		PAPER	233	22,089
WAITE	WASH	1	0	0	0	N						
WALDO	WALD	5	19	1	0	Y	1972	JE O'Donnell and Associates		PAPER	600	11,500
WALDOBORO	LINC	55	44	10	0	Y	4/1/1969	JE O'Donnell and Associates	Y	GIS-PAPER	2,999	41,473
WALES	ANDR	5	7	0	0	Y	4/1/1972	JE O'Donnell and Associates		PAPER	754	9,500
WALLAGRASS	AROO	6	0	0	0	Y	9/1977	John Cahoon		PAPER	536	
WALTHAM	HANC	54	0	0	0	Y	1994	Eastern Mapping Service		PAPER	410	18,708
WARREN	KNOX	28	31	0	0	N				PAPER	2,583	27,408
WASHBURN	AROO	15	0	2	0	Y	6/20/1978	SLF Inc		PAPER	987	23,000
WASHINGTON	KNOX	55	5	39	0	Y	4/1/1980	Coffin		PAPER	1,497	23,940
WATERBORO	YORK	64	2	0	0	Y	1/1/07	JW Sewall Co.	MC	PAPER	4,474	30,349
WATERFORD	OXFO	116	0	0	0	Y	1974	JE O'Donnell and Associates		PAPER	1,725	30,729
WATERVILLE	KENN	3	0	0	0	Y	4/1/1992	Aerial Survey and Photo	MC	GIS-PAPER	4,978	5,394

WAYNE	KENN	19	6	2	0	Y	4/1/1979	SLF Inc	PC	PAPER	1,116	11,480
WEBSTER PLT	PENO	14	0	0	0	Y	4/1978	JW Sewall Co.		PAPER	73	20,349
WELD	FRAN	110	0	0	0	Y	4/1/1976	JW Sewall Co.		PAPER	843	6,884
WELLINGTON	PISC	39	9	0	0	Y	4/1/1979	JW Sewall Co.		PAPER	479	25,096
WELLS	YORK	80	17	6	0	Y	9/1/1975	JW Sewall Co.		GIS	6,893	29,697
WESLEY	WASH	50	0	3	0	Y	1970	JW Sewall Co.		PAPER	709	30,910
WEST BATH	SAGA	14	9	12	0	Y	3/3/1968	JE O'Donnell and Associates	Y	GIS-PAPER	1,483	7,156
WEST FORKS PLT	SOME	4	0	0	0	Y	1997	Sackett & Brake Survey, Inc.	PC	PAPER	116	30,467
WEST GARDINER	KENN	4	0	0	0	N			PC		1,768	15,000
WEST PARIS	OXFO	33	2	0	0	Y	4/1/1975	JE O'Donnell and Associates		PAPER	1,091	14,611
WESTBROOK	CUMB	20	6	0	0	Y	1997	GIS Mapping & Analysis	MC	GIS	6,004	8,500
WESTFIELD	AROO	42	0	0	0	Y	1978	SLF Inc		PAPER	477	25,385
WESTMANLAND	AROO	8	0	0	0	N					120	21,533
WESTON	AROO	52	0	0	0	Y	4/1/1976	JW Sewall Co.		CAD-PAPER	605	19,218
WESTPORT ISLAND	LINC	17	0	1	1	Y	2001	JE O'Donnell and Associates	PC	PAPER	997	5,362
WHITEFIELD	LINC	16	0		0	Y	5/1983	JW Sewall Co.	PC	PAPER	1,734	
WHITING	WASH	98	0	0	0	Y	2005	JW Sewall Co.	Y	GIS-PAPER	831	
WHITNEYVILLE	WASH	28	3	0	0	Y	4/1978	JW Sewall Co.		PAPER	242	
WILLIMANTIC	PISC	9	0	5	0	Y	6/30/1990	JW Sewall Co.		PAPER	410	27,768
WILTON	FRAN	84	4	27	0							
WINDHAM	CUMB	73	42	8	0	Y	7/1/1963	JW Sewall Co.	MC	GIS	8,119	28,749
WINDSOR	KENN	96	18	0	0	Y	4/1/1976	JE O'Donnell and Associates	PC	PAPER	1,433	19,473
WINN	PENO	109	0	0	0	Y	4/10/1975	JW Sewall Co.		PAPER	27,644	439
WINSLOW	KENN	96	53	2	0	Y	6/1/1969	JW Sewall Co.	Y	GIS-PAPER	4,079	
WINTER HARBOR	HANC	9	0	0	0	Y	5/23/05	JW Sewall Co.	MC	PAPER	681	7,226
WINTERPORT	WALD	21	12	0	0	Y	4/1/1964	Wright-Pierce		PAPER	1,973	22,007
WINTERVILLE PLT	AROO	10	0	0	0	Y	4/1/1979	John Cahoon		PAPER	491	9,430
WINTHROP	KENN	37	11	15	0	Y	4/1/1968	JW Sewall Co.	MC	CAD-PAPER	3,620	18,018
WISCASSET	LINC	13	0	4	0	Y	4/1/1973	JE O'Donnell and Associates	PC	PAPER	2,089	13,454
WOODLAND	AROO	19	0	0	0	Y	1998	Lee Doody	Y	GIS-PAPER		
WOODSTOCK	OXFO	140	0	1	0	Y		JE O'Donnell and Associates	Y	GIS-PAPER	1,539	29,243
WOODVILLE	PENO	47	0	0	0	Y	1/1/1972	JW Sewall Co.		PAPER	215	215
WOOLWICH	SAGA	52	7	11	0	Y	4/1/1973	JE O'Donnell and Associates	PC	PAPER	1,890	19,740
YARMOUTH	CUMB	2	1	2	0	Y	4/1/1958	Wright-Pierce	Y	GIS	3,488	7,209
YORK	YORK	18	19	32	0	Y	4/1/1968	JW Sewall Co.	MC	GIS	8,923	28,071

Building the Integrated Land Records System for Maine

Maine Library of Geographic Information

The Maine GeoLibrary recommends ongoing development and funding of a program to complete this critical piece of our information infrastructure

What properties have water access? Where is the land in the Tree Growth program? Where is the real estate in foreclosure or in pre-foreclosure status? How many private parcels abut or are in visual range of wind farms? How many individual properties lie over a particular wetland or deer yard? Where are all of the properties that have sold or split in the past year?

All of these questions can be answered with simple queries against an integrated land records database. At present, none of these questions can be answered here in Maine.

When land records in the form of digital tax parcel maps are integrated with information from municipalities, counties and state agencies, an indispensable tool is created for modern governance: the Integrated Land Records System.

Over the past two decades geographic information systems (GIS) have been used to enable these tools, primarily at the local level in larger cities. Maine's GeoLibrary has taken impressive initial strides toward integrating these systems more cohesively through targeted grants and planning over the past ten years.

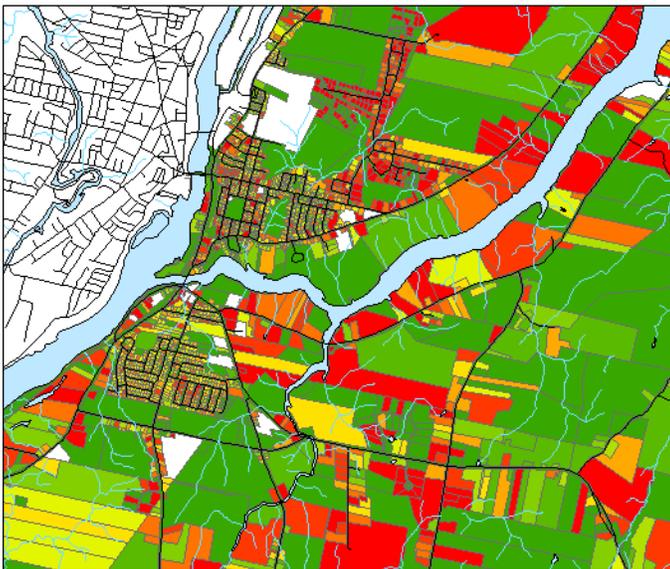


Figure 1: Town parcel map color-coded in a GIS according to property value. The reds are higher value while the greens are lower.

But the overall coverage in the state remains spotty and inconsistent. Maintenance of the data that do exist is not uniform or dependable, and hundreds of towns around the state have no access to the technology and its benefits.

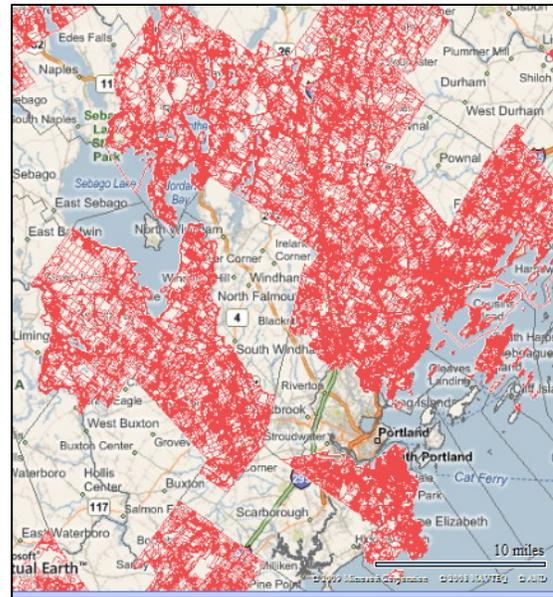


Figure 2: Map showing towns where digital parcel maps exist; note the large gaps in coverage, even in the densely populated Portland area.

Digital parcel mapping is the only practical means to exhaustively inventory property records, locally, regionally or statewide. It provides an intelligent map that may be queried, symbolized, shared and refined to deliver a common operating picture for all potential users of property records data --- not just property assessors, lawyers or appraisers, but analysts, regulators and enforcement officers in environmental agencies, transportation, health and economic development.

The GeoLibrary is developing plans and processes that will advance Maine rapidly toward an integrated system for managing and accessing property records. It has been a sustained process of information gathering and support-building, and has the endorsement of all GIS-using state departments, counties, numerous federal agencies, hundreds of municipalities and a large number of commercial and non-governmental entities.

In Maine, where land plays such a vital role in local livelihoods and our collective sense of place, the tools should be available to address and answer these and countless other questions vital to our state and local interests.



MAINE GEOLIBRARY

