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GIS Toolkit – How To Get Started

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PROPERTY RECORDS INDUSTRY ASSOCIATION

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For
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Introduction

The integration of Geographic Information Systems (GIS) and land records can create modern property record systems, providing value for all stakeholders interested in researching and locating properties. The value to jurisdiction offices is the ability to combine and share data in an enterprise-wide environment where the data connects all departments. The value to the public is easy-to-use applications that will allow access to land records documents.

When integrating GIS and land records, a common key, or identifier, which is shared by GIS, assessors, and recorders, is essential. The most common and probably the best key is the Parcel Identification Number (PIN). “The use of PINs to link a wide variety of records of both the nature and extent of land features and interests is essential for the development of a modern land records and information system.”¹

GIS integration considerations may seem overwhelming to implement but, with today’s Land Records Management Systems (LRMS), these tasks become a routine part of day-to-day business activities. Integrating data from the beginning when a document is created is a valuable approach to data management and will serve the jurisdiction and the public now and in the future.

This toolkit will help facilitate the integration of GIS and land records by offering analysis and considerations. It was derived from real-world implementations with perspectives from recorders, LRMS vendors, GIS experts, and other industry partners.

¹ Reference - Modernizing American Land Records, by Earl F. Epstein, page 181.

Overview of Integration

1. Define the goals of integration.
 - a. Find every document related to a parcel of land by clicking on a map.
 - b. Share land records and parcel data.
 - c. Establish a clean repository with accurate index information.
 - d. Enable data access from any device, anywhere, and at any time.
 - e. Provide new services for constituents, e.g., new ways to find documents.
 - f. Sell or provide more documents, depending on specific goals.

2. Identify criteria for the integration.
 - a. Who will use this integrated system?
 - b. Which document types will be available through the integrated system?
 - c. What is the point in time that defines how far back the search will go?
 - d. What types of searches beyond grantor/grantee will be accessible?
 - e. What other systems within the jurisdiction will be integrated?
 - f. What other integration goals does the jurisdiction have?

3. Identify the recognized challenges.
 - a. Buy-in from other departments within the jurisdiction.
 - b. Applicable technology solution and provider(s).
 - c. How to pay for integration.
 - d. Adequate work load capacity with current personnel.
 - e. The recorder's willingness to index information that is on the document but not a required by policy or statute? index field.
 - f. The recorder's willingness to gather and index information that is not on the document, for example PIN and/or property address.

Current Integration Status

1. Does the recorder currently integrate with other public offices within the jurisdiction? Buy-in from the following public offices is critical for successful integration.
 - a. GIS.
 - b. Taxing authority.
 - c. Assessor.
 - d. Surveyor.
 - e. Governing board or financial authorities.
 - f. Information Technology (IT).

2. Is the Parcel Identification Number (PIN) the common key to integration?
 - a. If no, what field is used as the common key?
 - b. Could the common key be changed to the PIN? If not, why?

3. Is the PIN required?
 - a. Which department assigns/maintains the PIN?
 - b. Who ensures the accuracy of the PIN?

4. Which one of these levels best describes the recorder's current degree of integration?
 - a. Level 0 – the assessor and/or GIS office gets a paper copy of the deed and posts to a map (the majority of counties do this already)
 - b. Level I – the assessor and/or GIS office gets an electronic copy of the deed and updates GIS to reflect change(s)
 - c. Level II - a web-based platform allows deed information exchange between the recorder and the assessor and/or GIS office
 - d. Level III - all recorded documents are electronically exchanged between the recorder and the assessor and/or GIS office
 - e. Level IV – integration includes all rights, restrictions and responsibilities in local government such as registry, history, restrictive local ordinances
 - f. Level V - all land records are part of the multi-purpose [cadaster](#), including state and national restrictions

5. What is the recorder's understanding of current capabilities and technology regarding the Land Records Management System (LRMS)?
 - i. A modern LRMS offers web connectivity, services integration, Application Program Interface (API). If the LRMS vendor views this as an opportunity to add value to the relationship, they will make the image and index database available for GIS systems connection. Are modifications needed to achieve this?

- ii. The LRMS should be capable of associating, at minimum, the following fields: PIN, address and legal description.
- iii. Options are typically available within the LRMS to provide a communications bridge between the land records repository and the GIS system.
 - 1. Put the desired document index information into a table, which the GIS system can access and connect. These tables are known as *database views*.
 - 2. Provide a programming interface for other systems, including GIS, to connect directly into the document database. This interface is known as API.
 - 3. Extract Transforming Load (ETL), which extracts information from the LRMS and generates tables that other systems can load and read. This table generation is known as ETL.
- iv. Capability to properly maintain information related to the PIN within the LRMS.

The robust functionality described in the examples in Appendix I requires one of the above stated connectivity options.

The end goal is a responsive system accessible from multiple devices (mobile, desktop, laptop, and tablet). The LRMS vendor should enable credit card/e-commerce access to the recorder's online portal, so that when anyone uses this GIS integration and finds a document they want to purchase, they can complete the purchase on their own. If unsure of your system's capability, talk with the LRMS vendor or contract with an outside consultant who can facilitate the conversation.

- 6. What is the recorder's understanding of GIS Mapping Technology?
 - a. The recorder's office will need access to web services that are either on a server or hosted online. The GIS office or assessor should have access to these services.
 - b. The recorder's office must have at least one secure login for a web-based mapping solution, or use a GIS server.
- 7. What is the Availability of Technical Staff
 - a. Is there in-house, dedicated GIS staff?
 - i. If yes, can they help with current parcel data and various aspects of the web-based mapping solution? Do they house the parcel data in a modern/current spatial database (location information)? The ideal is to have parcel data in an enterprise geodatabase (specific type of spatial database that is shared by entire organization).
 - ii. If no, consider working with an outside consultant from the outset.

- b. Does the recorder have access to in-house database administration staff?
 - i. If yes, do they have the hours to commit to this, and can they coordinate with in-house GIS staff? Can they facilitate database access through automated routines?
 - ii. If no, consider working with an outside consultant from the outset.
- c. Does the recorder have in-house IT staff?
 - i. This staff can be most important of all, above GIS staff. Internal IT staff is needed to enable permissions and remote access for outside consultants. For example, an outside consultant would need to have a login/account to your SQL Server, with certain permissions.
 - ii. If no, work with whomever provides IT services to provide access and permissions for outside consultants.

Steps to Integration

1. When the PIN is not required by statute or ordinance:
 - a. Request the document preparer to include the PIN on the document being submitted.
 - b. Educate the document preparers on the value of providing an accurate PIN and where to find it.
 - i. Easier searching for title companies.
 - ii. Easier intra-jurisdiction searching.
 - iii. Ease and accuracy of indexing in the recorder's office.
 - iv. Opportunity for a single web access point with all property information readily available.
 - a. Address.
 - b. Parcel identification number (PIN).
 - c. All recorded documents.
 - d. Links to probate, family court and vital records.
 - e. Tax bills.
 - f. Easements.
 - g. Assessment information.
 - c. Locate the PIN via three primary location descriptors.
 - i. Property address, legal description, and PIN.
 - ii. These descriptors can also be used to a validate PIN.
2. When the PIN is required:
 - a. Confirm its presence on the document.Continue with normal recording procedures.
3. Determine the starting date for capturing the PIN.
 - a. Start with a point in time and go forward.
 - b. Determine if you want to integrate older documents.
 - i. How much PIN history is available?
 - ii. How far back do electronic documents go?
 - iii. Has the PIN format changed over time?
 - iv. Is the PIN genealogy available?
4. Consider the accuracy of the PIN on the document
 - a. Key it (PIN) as you see it (unverified).
 - b. Correlate the PIN to the address and legal description. An LRMS, as well as the assessor or taxing authority, can provide tools or aid to ensure accuracy of the PIN.
 - c. Add the corrected PIN, in addition to the original PIN, into the index, if applicable.

- d. When initiating this process, policing the accuracy of the PIN may be necessary until the maintenance phase is reached.
 - e. Be cognizant of the genealogy of the parcel – splits and joins – to be able to link older documents with the current parcel map.
5. Define the major players for this integration effort.
- a. IT - for handling the database programming or to enable data access.
 - b. Assessor – for the PINs, tax maps and data stored in assessment software.
 - c. GIS department – for aggregating data for mapping applications.
 - d. Address authority – for providing one of the legs of the stool.
 - e. Recorder – for providing the authoritative source for the records.

Additional players that may be involved in integration efforts:

- a. Zoning authority – for identifying use restrictions.
 - b. Tax authority – for taxing information.
 - c. Public Works/Transportation – for easements and right-of-ways.
 - d. Surveyors – for the legal description.
6. Which additional offices may benefit?
- a. Law enforcement.
 - b. Emergency services.
 - c. Treasurer's office.
 - d. Courts.
 - e. Municipalities.
7. Which offices might object?
- a. Policy-makers.
 - b. Budget office.
 - c. Any office or entity resistant to change.
8. Schedule meetings with stakeholders.
- a. Solicit buy-in by emphasizing benefits.
 - b. Discuss implementation.
 - c. How will it affect different offices and industries?
9. Establish a realistic implementation schedule; assume it will take twice as long.
10. Include when and how major players will be affected.

11. What could go wrong with the implementation project?
- a. Stakeholders change their priorities or do not make a long-term commitment to the project.
 - b. Newly elected officials may have different priorities.
 - c. LRMS and the assessor system become out-of-sync with installation of new system or software.
 - d. Staffing and budget restraints affect the project costs.
 - e. Lack of staff training in programming capabilities.
 - f. New legislation affecting privacy and redaction of key information in the public record.
 - g. Change in licensing agreements affecting the GIS platform.
 - h. Cyber-attacks affecting the implementation process.
 - i. Declared State of Emergency

Conclusion

Use this PRIA toolkit to start an integration project, recognizing that not all historic records may be integrated at the same time. Don't let the lack of a perfect plan deter the process. Understanding the desired endpoint helps with making decisions required throughout the project. A process can and will evolve. Laying the foundation and starting the implementation is a major step for the future.

GIS and land records integration will result in a new web map that can be added to the other applications your GIS department has online now and/or it can be added to a recorder website. Easy access to authoritative information is now the norm. Integration of land records with GIS allows the recorder to keep pace with this trend and modernize access to the land records.

For live examples of integration on the web, see below.

Appendix 1

[Chisago County, MN](#)

This is an example of a county recording jurisdiction on an integration with TriMin LandShark LRMS.

[Racine County, WI](#)

Another example of a county integration with TriMin Landshark LRMS.

[Polk County, MN](#)

This is an example of a county recording jurisdiction on an integration with Tyler Document Pro LRMS.

[Waushara County, WI](#)

This is an example of a county recording jurisdiction on an integration with Fidlar Tapestry LRMS.

[Land Records HUB](#)

The integration that is outlined in this GIS toolkit could generate a site like this. This is a concept/demonstration site conveying the eventual goal of fully modernized land records - a single destination page that provides the public with access to parcels, ownership, tax and sales, and recorded documents.

[Greene County, OH Hub](#)

This is another example of a one-stop site that the public can visit to gain land records information; this one happens to be focused on assessor's information, but it could be enabled for recorded documents.

[Greene County, OH Parcel Viewer](#)

This web map shows a deed history for any parcel selected.

[Jefferson County, WA](#)

This web application is just to round out the examples; there are many similar integration options, such as linking to plat and survey documents, permits, etc. In this example, when you select a parcel, links to a full array of land records information.

Appendix 2

Toolkit Checklist

1. If PINs are currently part of your index

- a. Find out how long this practice has been in place.
- b. When did ordinance, statute or office practice begin?
- c. Determine which document types are indexed with PINs.

SKIP TO 5

2. If PINs are not part of your index, can they become a requirement?

- a. If yes, through ordinance, statute or other, e.g., regulation, policy, standards or best practices?
 - i. Start conversations with jurisdiction attorney.
 - ii. Board.
 - iii. Legislators.
- b. If no, how to get submitters to voluntarily comply.
 - i. Get “buy in” from submitters.
 - ii. Send letters, host a luncheon, communicate the “why” to anyone that submits documents such as attorneys, title companies, title closers, title underwriters, local municipalities, governing board members, etc.
- c. Determine which document types will be indexed with the PIN.
- d. Determine if or how to index PINs that are not provided on documents.
- e. Train staff to include PINs as part of the index.

3. Meet with the assessor or similar authority to gain access to all PINs and addresses, usually stored in a software application, such as Computer Assisted Mass Appraisal (CAMA).

- a. This data will be used to start the conversion process with the recorder’s office LRMS vendor.
- b. Most likely, there will not be complete data for each parcel.
 - i. PIN, ADDRESS, LEGAL = Complete Parcel Data (three legal location descriptors).
 - ii. Genealogy of parcels relative to current PINs.
- c. The recorder’s software vendor should be able to provide a percentage of complete parcels for the jurisdiction.
 - i. The volume of parcels may prompt choosing a starting date range for records included in the PIN project.
 - ii. If the percentage of complete parcels is low, consider starting with current documents and working backwards.
- d. Determine the best way to fill in the missing pieces of information accurately.
 - i. Work with LRMS and/or integration software vendors to determine the missing information and how best to increase the percentage of complete parcels for jurisdiction.
 - ii. Examples include export to Excel and identify missing fields or internal programs provided by the integration software vendor.

- 4. Once you reach an acceptable percentage of complete parcel data, start conversations with a GIS partner to determine the best way to display your data via a mapping application.**

- 5. Once your maps are complete, roll them out to the public.**
 - a. Press release.
 - b. Governing Board meetings.
 - c. Letters.
 - d. Luncheon.
 - e. On website and social media platforms.