

**CREATION OF A MASTER ADDRESS POINT LAYER**  
*- A Collaborative Approach to a Complex Project*

**By**

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## **Abstract**

As GIS professionals, we know the importance and the value of a complete and accurate Master Address Point Layer. The article will discuss the creation of such a layer of almost 300,000 address points for Will County, IL, which is an ongoing project.

The article includes discussions of the history and background of this project, the stakeholders involved the proposed steps, and the potential uses of the final product. Both technical challenges and challenges on inter-departmental coordination will be addressed. It intends to provide insights on how such a large scale data development project involving multiple departments with their own priorities can move forward with leadership, determination, cooperation and a little bit of personal interaction. The author also hopes to use this article to exchange ideas and thoughts among GIS professionals who are working on or will work on the same or similar projects.

## **I. Introduction**

Will County, IL is located in the southwest of the Chicago Metropolitan Area, with its county seat, City of Joliet, being only an hour train ride or 50 minutes drive away from downtown Chicago. It covers 849 square miles in area and has a population of about 673,000 as of 2007 with more than 34% increase since last census in 2000, making it one of the fastest growing counties in the United States. The rapid growth allowed the county to have enough resources to apply technologies to improve its services. GIS is one of them.

The GIS Dept. of Will County, along with other departments whose operations require accurate addresses and their associated points on the map, has talked about the need for a Master Address Point Layer for over a decade. With the support from the county executive and the advancement of the technology, a preliminary address point layer was generated from the parcel boundary and the real estate database in May 2005 at the request of 911. However, the project never took off for one reason or another to produce a complete and accurate layer that other departments can use or integrate until 2007. In spring 2007, a team was formed to take on this project with GIS department leading the way. The GIS department initiated the process by making a project proposal spelling out the benefits, the methodology, and the timeline of the project. It is an evolving document to which ongoing changes are made to reflect the practical concerns and system variations of each department involved.

## **II. Benefits of a Master Address Point Layer**

All the stakeholders agreed that a county-wide Master Address Point Layer would have the following benefits for daily departmental operations:

- Improve productivity of any departments within the county when they need addresses in their business processes or transactions

- Reduce redundancy on address maintenance
- Facilitate the address maintenance workflow to improve accuracy and minimize errors
- Help create a geo-referenced address point layer that is consistent with tax parcel polygon centroids for uses in many departments requiring points for addresses
- Allow for address oriented spatial search and analysis, for examples: finding emergency facilities or assigning students to schools according to geo-coding against the address point layer
- Establish an address standard that matches regional and/or national formats

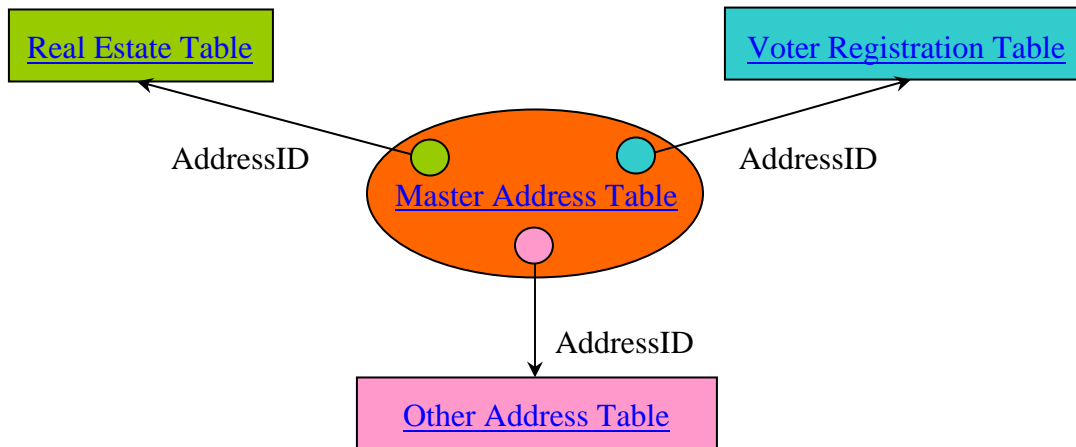
### **III. Stakeholders in this Project**

The typical stakeholders in the project were those departments that have an interest in using address information when offering their services to the public and the offices that provide resources and political supports, including:

- GIS – GIS department will take a leading role in database design, project coordination and communication among departments, project management on both in-house efforts and outside consultants if needed;
- Supervisor of Assessment, County Clerk, 911 – Each of these departments maintains its own source of addresses right now. These sources of addresses need to be cleaned up before being part of the Master Address Point Layer;
- Information, Communication and Technology – ICT will assist in setting up, maintaining, and installing any software and hardware and other aspects associated with this project;
- County Executive Office and County Board – Assist in overseeing the project and providing support and resources;
- Other User Departments – Such as Land Use and Highway will provide input from their perspectives;
- Private Contractors – Their expertise may be needed down the road to ensure that integration between vendor systems for various departments can be completed without major problems;

### **IV. Proposed Database Design**

The following illustration shows the relationships between the attribute table of the Master Address Point Layer and the tables from user departments. The final Master Address Point Layer will be stored in MS SQL Server with ArcSDE support. Other departments' tables will be in a database compatible to the MS SQL Server for integration.



An AddressID will be created to be the unique identifier that exists in all the tables shown above. This unique identifier will be the primary key in the attribute table of the Mater Address Point Layer and the foreign key in other user department tables so that the attribute table of the Mater Address Point Layer can be linked in a one-to-one or one-to-many relationship to the user department table. The goal is that when the project is completed for user department its address information will be obtained from the attribute table of the Mater Address Point Layer through linking the AddressID and its table will no longer contain any address information other than their department-relevant information plus the AddressID.

In May 2005 a preliminary Master Address Point Layer was created at the request of Will County 911. It was a simple layer created by linking parcel layer with real estate table through PIN (Parcel Identification Number). The points were generated by extracting the centroids of the parcels. The fields in the attribute table were copied from the real estate table.

The following figures show the current or proposed design for each user department address table and the attribute table of the Mater Address Point Layer.

Name	Type	Size
AddressID	Long	6
PIN	Text	16
HouseNum	Text	8
PrefixDir	Text	2
PrefixType	Text	4
StreetName	Text	30
SuffixType	Text	4
SuffixDir	Text	2
Community	Text	20
State	Text	2
County	Text	8
ZipCode	Text	5
Zip4	Text	4
UnitNumber	Text	20
FullAddress1	Text	50
FullAddress2	Text	40
Alias	Text	40
EditorName	Text	30
LastUpdate	Date	mm/dd/yyyy
Notes	Text	100
Shape		

**Figure 1. Field Definitions of the Attribute Table of the Master Address Point Layer**

Name	Type	Size
Address ID	Long	6
PIN	Text	16
Txcd	Text	5
Prpty_cls	Text	5
LA_land	Double	8
LA_bldg	Double	8
SA_land	Double	8
SA_bldg	Double	8
...	...	...

**Figure 2. Real Estate Table Field Definitions**

Name	Type	Size
Address ID	Long	6
VoterID	Text	8
LastName	Text	30
FirstName	Text	30
MiddleName	Text	30
Precinct	Text	6
...	...	...

**Figure 3. Voter Registration Table Field Definitions**

Name	Type	Size
Address ID	Long	6
OtherID	Text	8
LastName	Text	30
FirstName	Text	30
MiddleName	Text	30
Precinct	Text	6
...	...	...

**Figure 4. Other Address Table Field Definitions**

## V. Steps to Achieve the Goal

- Master Address Table Format – The field definitions for the attribute table of the Mater Address Point Layer were largely adopted from the real estate table, but modifications were made to conform to the Federal NENA standard for our 911 department. The definitions were presented to the relevant parties to get feedbacks and were finalized as a result.
- Data Clean-Up – The GIS department is taking the lead on cleaning up the existing address errors in the preliminary master Address Point Layer. With hundreds of thousands addresses at play it is a very long process. This is where we are at now for this project. The department is taking a comprehensive approach to cover every single address of the county. Staffs are going section by section and township by township to check house numbers, street names, street types, prefix and suffix, and misspells. After addresses in one township were checked, PINs (Parcel Identification Numbers) will also be checked against the most updated parcel layer for any errors. An ArcObject tool was built to do that. Then a comparison analysis would be performed against the vote registration table to spit out any discrepancies that will be sent to the County Clerk for address corrections in their table. After the whole cycle is gone through, staffs will move to the next township. With twenty four townships in the county, we expect 18 to 24 months to complete the process for the whole county.
- Assignment of the AddressID – After the data clean-up is done, an AddressID will be created for the attribute table of the Mater Address Point Layer as the unique identifier.

This AddressID will be assigned to the real estate table though linking the PINs and to the vote registration table through matching up the addresses.

- System Integration – After the data is cleaned and the unique identifier is assigned, the integration between the attribute table of the Mater Address Point Layer and other tables in vendor systems becomes ready. For existing vendor system, some modifications may be needed to accommodate the field definitions of the attribute table of the Mater Address Point Layer. For new vendor system, it needs to be designed to comply with the attribute table of the Mater Address Point Layer.
- Data Maintenance – After the project is completed, a single department will be responsible for changing the address information in the attribute table of the Mater Address Point Layer. Any other department that receive address information in their daily operation will play a support role to report the changes to the address charging department for final verification and physical data entry into the attribute table of the Mater Address Point Layer. An address update and editing application may be developed to provide an interface for each of the departments to accomplish that.

## **VI. Things Learned from the Project**

- **On project management**
  - a. Involve stakeholders as early as possible – It is critical to involve all the relevant parties at a early stage so that no surprises will come up at the last minute that require drastic changes of your original plan.
  - b. Help stakeholders identify their needs and challenges – Each stakeholder has its own system and turf to protect. It is more convincing to show them the benefits of the project will bring with minimum changes to their systems. One on one meeting would be one of the best approaches to get them on board while keeping your vision as intact as possible.
  - c. Set up a clear vision for everyone to focus on – After a project started for a while, it is easy for people to lose track of what the initial goal is. It is important to keep everyone focus on the same vision through period meetings, updates and discussion even it may be changed over the course.
  - d. Get as much support from the executive branch and legislative branch as possible – Their support are critical to move the project along when things are not turned out as planned or conflicts among departments need to be resolved and when additional resources are needed to make the project a success.
- **On technical area**
  - a. Do your homework – It is critical to understand the basics of how other relevant departments operate. It will help you sell your project to others and minimize the problems down the road.
  - b. Seek outside examples – Other people’s experience is valuable in offering ideas, avoiding mistakes and eliminating skeptical concerns within organization.
  - c. Team work – Weekly status meetings and communications among staffs and departments will ensure that everyone is on the same page on the technical details and follows the same procedure so that concrete results can be achieved within a time

frame as planned. Small issues are resolved in time so they will not become big problems later.

## **VII. Conclusion**

This is an ongoing project for Will County. It is a complex project because it involves many departments and systems and crosses a time frame of multiple years. But it is also an exciting opportunity to build working relationships with various users and to establish a project template upon which future projects can be built. Like many projects, it is being done and can only be done through a collaborative way. Once the project is completed, it is expected to have positive impact on the county's address related operations because of its accuracy and completeness at a timely manner.