

An Investigation into the Vagaries of Local Addressing Issues

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Abstract:

County government uses addresses for a plethora of purposes, from issuing permits to E911 dispatch. Unfortunately these myriad applications (whether paper or digital) are often quite independent of one another and created without regard to standardization or efficiency. What can a jurisdiction do when it finally realizes that a dozen address databases are too many? How can they be automated and cross referenced or collapsed to ensure the accuracies each inherently have are maintained?

Ask any youngster on the street if they know their address and you'll likely get an affirmative response. Ask any adult on the street if they own property, and if so, what their parcel number is and I can almost guarantee a blank look. This is why addressing is so important and why it makes up a crucial portion of any governmental customer service record. Where do addresses come from though, and how are they maintained? This paper will discuss these issues and present how Seminole County Florida currently creates and maintains address data.

Background:

Seminole County is located in Central Florida and has a land area of approximately 373 square miles. Our population according to the 2000 Census is 365,000 people, and we enjoy a healthy tax base ranging from eco-tourism to being home to a number of corporate headquarters and high technology facilities. The County has seven incorporated cities within its borders. We are bordered on the west and south by Orange County.

The Board of County Commissions [GIS](#) program was started in 1994. Since then, over 200 layers of data have been automated for County Departmental and Division use. Seminole County GIS takes advantage of existing fiber wide area network (WAN) and local area networks (LAN) to tie together widely separated County offices in order to have efficient and effective ways of sharing data. This is accomplished using a central GIS server housing the County digital map library and floating or sharable GIS software licenses.

ESRI software compatible with the [Property Appraiser](#) and other regional and state agencies was purchased and a pilot automation project initiated in March, 1995. The Property Appraisers' staff finished the parcel base map in February, 1996 and made it available through an inter-local agreement to other County Departments and Divisions. A copy of their parcel data is maintained on the GIS server and is updated nightly as edits occur.

The Property Appraisal data was used to initiate a digital map library. This library was established in February, 1996, and additional GIS data and software was obtained. Signed inter-local agreements were established with the cities of Altamonte Springs, Casselberry, Sanford, Longwood, Lake Mary, Oviedo, and Winter Springs to facilitate GIS data sharing. To date, data obtained from a variety of sources or automated in house amount to well over 700 gigabytes of map information, aerial photography, and databases. All data created in house is designed to fit

the parcel base. This library is maintained in an Arc/Info format and utilizes State Plane Coordinate (SPC) feet, Florida East, NAD 83 as its common datum.

The County GIS network currently consists of over 200 users employing a wide variety of ESRI GIS tools. These tools include UNIX workstation ArcInfo 8.x and ArcView3.x running on an IBM RS6000 J40 server operating under AIX 4.3.2, ArcGIS 8.x Desktop, ArcView 8.x ArcView 3.x, SQL ArcSDE, ArcExplorer, and ArcIMS all running in a WIN2000 environment, and ArcPad running on iPaq Pocket PCs using CE V.3.0. Our seven member municipalities have a mixture of ArcView 3.x and 8.x licenses depending on jurisdiction for their own internal use. Core County GIS staff consists of 4 people in the Information Technologies/Information Services Division and this group is also responsible for managing the County Imaging Program.

The County, our member municipalities, the Seminole County School Board, all four campuses of Seminole Community College, and FL DOT share an interconnected network of over 3300 strand miles of fiber built and maintained by the County Traffic Engineering Division. Network connectivity and overall management is assured by the County IT / Telecommunications Division. What this provides our users is a central County Library of GIS data accessible “live” for editing (if they are the custodian) and analysis by any organization on the County network or for viewing via the web.

Addressing Functions in the County

Addressing, a seemingly simple straightforward process, is made more complex by the plethora of address databases present and maintained in our organization. Seminole County maintains (or has maintained) a typical address ranged street centerline file containing from and to, left and right address information, an MSAG Public Safety dispatch database based on phone numbers with associated addresses, a parcel specific point address file and a related multiple address file, as well as property (situs) and owner address fields in our Property Appraisal database. Finally, there are (or were) separate address databases utilized for elections, utility billing (for water service), Municipal Services Benefits Unit (MSBU) billing (solid waste hauler billing), issuance of building permits, and emergency management notification reverse 911 type calling.

To further complicate the issue, in Seminole County the County itself is responsible for addressing the un-incorporated County and three of our seven member municipalities, the other four cities are responsible for addressing themselves. There are a variety of overlapping government utility service providers and a variety of inter-local agreements for provision of both utility and Public Safety services. Each address database has its’ own users and custodians, and its’ own interconnections as far as applications. Every time a database entry is made in one of these disparate systems the opportunity exists for error to creep in. After all, is it US Highway 17/92, US 17&92, US Highway 17-92, or French Avenue?

So here’s the issue....we have the street centerline file, the situs address file, the E911 MSAG database, a variety of other billing and customer service maintenance databases and they all represent the same segment of US HWY 17-92 in a different way. The same was generally true with State Routes, County Routes, and to a lesser degree were also inconsistent in using suffix

direction and prefix directional fields. Also there was the issue that any given street might or might not be present in all files.

The comparison between various files also identified gaps in our centerline file primarily in private streets internal to apartment complexes, alley ways and the like which significantly affected its' ability to be used for Public Safety purposes. While our street centerline file was address ranged county wide, it is less accurate than our parcel specific situs file. Yet in our very accurate situs file we had 4 rather sizable holes due to the fact that we weren't responsible for addressing four cities, and while the Property Appraiser would guarantee a tax billing address for any parcel in the County, he could not guarantee the situs address (and multiple addresses on a parcel are another story). The GIS group address matches large volumes of data with pretty fair success, generally 95-98% (205,000 of 210,000 voters during a re-precincting project last year for example), but this was accomplished using a drop back geocoding process starting with situs, then the Property Appraisal database address data, and finally the street file, not the sort of approach one wants to take in a life and death emergency. This project also primarily caught issues or problems with residential addresses, not commercial ones.

While we all rather hope our bills can't find us, if there is an emergency there is very little time to waste. Our Public Safety standard is five minutes from call to arrival on the scene for the majority of service calls. This goal can be difficult to meet if your addressing is poor or inconsistent. Heaven forbid you send a rescue truck to the McDonalds at 1100 SR 436 in Casselberry instead of the McDonalds at 1100 SR 436 in Altamonte Springs! While E911 dispatch databases have been serving this purpose admirably for years, every dispatch center has its list of exceptions. Institutional memory is still important (we just know that this address means we have to ask this question...). Furthermore, these types of flat file address range databases don't generally lend themselves to address unique billing or permit type issues. Finally the federal mandate to be able to geographically locate 911 cell phone calls through GPS or by triangulation by cell requires a tighter geographic component to addressing. For these and other reasons, the County found it had to undertake an effort to flatten and streamline the process of addressing, while improving the overall quality of our addressing data. It was still felt two types of files (a point specific situs, and an address range line file) made sense but they needed to agree. While we still have a ways to go, we feel we are at least moving in the right direction within the constraints we work under.

Officially, addressing in Seminole County is accomplished in the County Planning and Development Department, or by the City Planning Departments in Altamonte Springs, Sanford, Oviedo, and Winter Springs. The process herein described is at the County level and does not necessarily include those four city jurisdictions. A parcel of land when it is being subdivided goes through a development review process typical of most jurisdictions. A preliminary site plan is presented and reviewed against our addressing Ordinance and includes a laundry list of addressing issues. These include such things as a determination as to whether the development name is unique, are the street names in the development unique and do the street types comply with existing standards? The lots each receive an address, as do utility boxes, outbuildings, etc. and the plan moves through the development review process. The preliminary addressing is done on a hard copy of the site plan, which along with any notes written on it becomes an official record and is (now) subsequently scanned. Until 1998 parcel specific address information was

written and stored on a paper parcel map, with the paper site plan as backup. When the site plan is approved, the lots receive parcel numbers, the parcel modifications make it to the parcel base map, and the addressing is then finalized using the parcel base for geographic placement as well as incorporation of the parcel number into the address record. Conversely the address information is incorporated into the parcel record.

In house editing applications were written in AML and have been used for a number of years to facilitate this process, with parcel information automatically extracted and added into situs tile undergoing maintenance for instance to save repetitive entry and error. Once the address update is complete the tile is returned to the central GIS library as an addition to our point Situs coverage. This then becomes a permanent addition to the addressing layer in our GIS. In turn this information is passed to all our member agencies and to the MSAG E911 database for use by Public Safety for dispatching purposes, as well as inclusion in the street centerline file. The street centerline file is drafted on the parcel base so that streets fit within our parcel base right of way. Developers are required to put up street signs prior to any building construction to facilitate emergency services response. These two files (situs and the street centerline file) have been widely used in the County for years but were not employed or referenced by "non GIS users". As more and more integration occurred between databases it became clear something needed to be done.

The first step in improving County address data was conducting a comparison between the various address/street databases available to clean up street name inconsistencies and to generate a master street name file. This master street name file was then utilized to populate a new HTE Land File database. Addresses in several legacy AS400 databases found to be in error during this comparison were corrected allowing us to collapse old permitting and utility billing databases into the new Land File. No records are accepted if they fall outside the existing street range and name or if an invalid parcel number is used. These parameters are maintained through a GIS interface which passes the latest versions of these datasets into the Land File directly from the Property Appraiser's Office (identifying new or revised parcel numbers) and from Planning and Development (new or revised addresses or street names).

An initiative by the Public Safety Department for field verification of address data was started in April 2003. These efforts consisted of plotting over 700 hardcopy sectional address maps and distributing them by service district to each fire station. When doing familiarization drives during their shifts, fire fighters verify address information, visibility, street signage accuracy, hydrant status, and several other items of pertinent information. When the section is complete, these marked up maps are returned and make the cycle through situs correction, street centerline correction, signage inventory and hydrant inventory custodians. Low tech perhaps but also very low budget, and the marked up paper maps are scheduled to all be turned in by July 2003. Firefighters on light duty have also been utilizing GPS and ArcPad software to located hydrants and make corrections to the records in the existing hydrants database. Each of our public safety vehicles already is GPS enabled, and this revised addressing data will be available in time to be utilized on the hardened laptops currently on order for each vehicle.

Recently we have begun encouraging those four cities the County is not responsible for addressing to directly update the County situs datasets themselves. This is being facilitated by all

the cities embracing our existing parcel addressing schema, an environment of open communication and sharing, and the County offering free GIS training. If the address is within the municipal border they have ownership and can add, correct, or delete it as needed. This makes data flow two way – the County to each of the cities via live fiber connectivity or quarterly CD distribution and city to County via a combination of either email / snail mail or in several cases interactive editing “live” of County data. All situs, parcel, and street centerline address data is also available free to the public via the web and through quarterly GIS Data CDs made available through our public libraries.

To assist in coordinating cross organizational issues, a County Addressing Committee was formed and is chaired by the County Public Safety Department. This group meets monthly and consists of a representative of the U.S. Postal Service, each municipality’s addressing representative, County addressing staff, GIS staff, Public Safety E911 staff, and a representative of the Sheriff’s Office Dispatch staff. This group is arbiter of addressing problems within the County and is empowered through an inter-local agreement between the County and the cities as well as by the County Addressing Ordinance. Addresses that cause confusion or that don’t conform are reviewed and a determination made as to whether they should be changed. The predominant question raised and discussed is generally does an address present a public safety concern. While it is both inconvenient and expensive to change addresses that don’t conform to the standards it is preferable to the alternative.

While there are still several addressing databases present in the County efforts continue to try to consolidate them where practical. The recent installation of SQL ArcSDE has also got us moving in that direction. The issues of ownership and custodial rights are giving way to cross jurisdictional data sharing and shared editing rights. As GIS use continues to grow and information integration plays a larger part in governmental operations this cost effective trend offers attractive possibilities.

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