GIS Remodels Address Points and Street Layers using NENA Industry Standards

A Case Study

Highlights

- Spatial address points and streets layers with NENA addressing standards applied
- GIS enabled layers for more accurate location

Return on Investment (ROI)

- Higher data accuracy contributes to critical services dispatching-priceless!
- Single source geodatabase ensures accurate data-updated nightly

Contact Us

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Using the power of a sophisticated Enterprise GIS, the Lake County GIS and PASS Divisions have enhanced and converted the former Structure Location and Streets spatial layers to become more accurate. This was accomplished by applying addressing industry standards and database constraints to increase the data integrity of these critical layers. A robust database schema was created that takes advantage of the GIS driven geodatabase model.

Background:

One of the bigger obstacles facing Lake County at the time was the lack of a GIS. That meant there was no single accepted source for streets, properties, or subdivisions. An old paper copy of the Property Appraiser's tax maps had been obtained and an address grid was painstakingly drawn on by hand – one half-section at a time. There existed no mechanism for updates to the base features other than the addressing staff themselves. A large portion of their time was spent adding new subdivisions, roads, and city annexations and tracking things like lot splits and combines. The data represented on the addressing maps soon diverged from other copies in the Property Appraiser's office and the Planning & Zoning office as each office maintained their own copies for their own needs and on their own maintenance schedule. In the initial re-addressing project all addresses were newly assigned based on lots and properties visible on these paper maps whether or not the properties actually existed on the ground – vacated subdivisions persisted on the maps so they were addressed; closed roads were still on the maps and were included in the MSAG.

The Issue:

Most county governments suffer through the growing pains of enhancing the way it maintains and improves upon its addressing function, and Lake County is no exception. In the past it was not unusual to find street name typos, name duplications, street directions incorporated as part of the base names where they should not be, or other non standardized naming conventions. There also existed multiple databases serving as addressing sources depending on the county business function and software utilized. One challenge in making county addressing more enterprise in nature will be to ensure all software applications that store address information are pulling from the same data source and have that data source standardized.

Extensive data scrubbing and QAQC of the data against other data sources such as the E911 MSAL and MSAG tabular databases was necessary. The end result needs to be a minimal 98% match rate among nearly 200,000 address points, and the assignment of new addresses needs to be performed by leveraging technology to ensure the address naming conventions and data integrity comply with NENA addressing standards.

The Solution:

Utilizing addressing models and best practices from NENA and other industry entities, GIS is refining, updating, and standardizing our addressing data components to maximize efficiency.

Implementing business rules in the form of database relationships between the address points and adjacent street segments was necessary to ensure that every address point is associated with the correct street segment by virtue of using the same street name. Checks were also made to ensure that the addresspoints spatially landed on the correct parcel of land. A better than 99.5% accuracy was achieved with this portion of the data QAQC.

Once the data was scrubbed, the next step was to decide on the database field structure for the *StreetNames* table. The street names consist of six fields each containing a potential portion of a full street name. *PrefixDirection, PrefixType, BaseStreetName, SuffixType, SuffixDirection,* and *AliasName* were created and combined on the fly through database scripts to create a *FullStreet-Name* field for the published Streets layer and linked to the Address Points layer. A unique StreetNameIS was also created to identify every line segment.

Then the address database needed to be standardized to ensure consistent data input. Therefore, the next step was to create *domains* which are a preconfigured list of available values for a particular field such as E, W, N, S, SE, SW, etc...for *PrefixDirection*. We did the same for the *StreetType* field with constrained values such as ST, BLVD, RD, PKWY etc…as prescribed by NENA and US Post Office standards. The *StreetNames* table was created of all unique street names in use in the county; and existing addresses were cross matched with existing streets to make sure that the geographic location of the address fell along the proper street.

The end product is the AddressPoints and Streets feature classes downloadable from the GIS FTP site.

Benefits:

Due to the meticulous data scrubbing and database schema design, these layers always reflects the most current, best available data. The county now has an addressing points file with both tabular and spatial components together, along with greatly improved data integrity and standardization. Addressing can now concentrate on assigning new addresses and cleaning up the remaining discrepancies. In addition, both these layers can contribute to enhanced responder dispatch time through a more accurate streets layer, and the *addresspoints* file can assist the municipalities with their respective addressing needs and aid the county reverse 911 notification system. While Lake County GIS in not officially the source of all city and county addressing and under no obligation to provide an official *addresspoints* layer, GIS does see the need to add value when possible by utilizing the latest GIS driven technologies and geoprocessing tools (such as geocoding) where applicable.