IAFC TECHNOLOGY COUNCIL

Case Study: Technology

"Getting GIS data during an emergency shouldn't be part of the emergency."
Kenny Miller, MD State GIO

Maryland Street Centerline and Addressing Synchronization Project

Since 2001 Maryland has been working hard to create a distributed, statewide GIS—one that ensures data stays close to its owner (where it is well fed and cared for!) but also provides easy access to data whenever it is needed.

At the core of this statewide GIS is the Maryland Street Centerline and Addressing Synchronization Project. This project has increased data quality by adding linear referencing at the state level, reducing redundancy, streamlining the data collection and maintenance process, improving interoperability and accessibility, and enhancing emergency response.

This coordinated data set is not only shared back to the counties and to other state agencies, but is also made publicly available through The National Map. The effort of the State Highway Administration (SHA) over the past several years has demonstrated the value of collaboration and partnerships among *people*—and it couldn't have happened without the vision and ongoing perseverance of SHA and Maryland's GIS community.

One of Maryland's biggest challenges has been making sure they get the right data to the right people at the right time. While this is especially true during critical emergency situations, such as the 2001 CSX tunnel fire in Baltimore City and Hurricane Isabel in 2003, it's also important for many day-to-day functions within the state such as planning, social services, environmental monitoring, natural resource management, and many others.

Distributed databases, kept close to their owners, and always up-to-date...easily shared through geodatabase replication. Users who need to *use* the data, don't need to wonder where to get it or if they have the latest version—they can just *use* it.

Thanks to the success of this first in the nation state-wide data replication project, public safety personnel using GIS in Maryland to pre-plan evacuations, respond to emergency incidents, or assess damage after a disaster, know they're working with the best data available. And good data means good decisions.

Problem

State Highway Departments and local governments often need different attributes to manage their road centerline files. Public Safety needs it all—and it needs to be accurate.

Goals

Create a process which allows data owners to maintain updates to their data while allowing partners access to seamless, near-real time state-wide address files.

Results

The Maryland street centerline project has resulted in an accurate, up-to date state wide street centerline file. It is served out real time to public safety partners and available for use throughout the state

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National Alliance for Public Safety GIS

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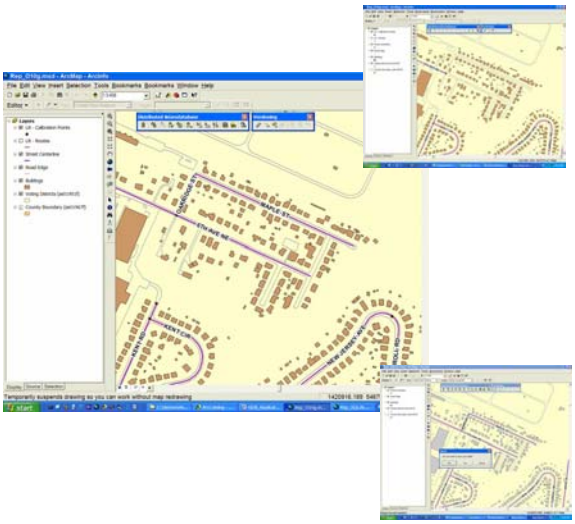

In the Maryland system, replication allows parent and child relationships to be established among disparate databases. Updates made by the data owners are automatically posted to an authoritative data set accessed by all project partners.

The Power of One (to Many)

In 2001, Jack Martin, now heading up Ann Arundel County's IT Department, joined the Maryland State Highway Administration to help re-engineer some of their information systems.

Jack had a vision for leveraging the synergies among the state's robust data systems and the highly detailed and accurate information maintained by the counties.

Today, after years of collaboration by the state and county partners, Jack's vision and the state GIS community's spirit of partnership have materialized into the nation's first, statewide, replicated authoritative data source for street centerlines.

Over time, as we move forward with broader implementations of this technology, the boundaries that currently divide us—whether geographic or discipline-specific—will dissolve. When data can easily flow to stakeholders across all levels of government, broad collaboration efforts--efforts such as "Transportation for the Nation"--will become a reality.

Matt Felton, Director
Towson Center For GIS

How They Did It

This program was initiated in 2001 when the State Highways Administration (SHA) developed a methodology to create a coordinated, common centerline with local governments, to face the challenge of multiple copies and variations on the same centerline—in a nutshell, to answer the big question of "which version is the official centerline"?

In the summer of 2006, they were able to successfully demonstrate the ability to automatically replicate and synchronize changes to the centerline database.

The goal, is to have every jurisdiction on board and we're planning to have this done by the Fall of 2008. Building upon the relationships fostered over the past 6 years of the cooperative centerline effort, SHA has already garnered support from 90 percent of counties in MD.

Geodatabase replication enables Maryland's counties and the SHA to establish a distributed system that allows all the centerline datasets in the state to act as one. A single centerline dataset can be distributed throughout the state and stored in whole or in part simultaneously on different servers, and when changes are made to any part of the system, those changes can be synchronized with the other geodatabases. In the centerline synchronization project workflow, the counties have principal responsiblity for creating and editing the geometry and attributes of the centerline features. Because geodatabase replication is enabled with ArcSDE technology, the participating counties can store their data in any of the supported database systems such as SQL Server, DB2, Oracle, or even SQL Server Express. The ability to utilize a free SQL Server Express database enables participation by smaller counties, which might not have the resources to purchase or maintain a commercial database system.

Once new or updated roads have been added to one of the county datasets, the county can push their changes to the statewide SQL Server geodatabase that is housed at The Center for GIS at Towson University. This replication process can be done through a VPN connection or securely over the internet using the web replication capability provided by ArcGIS Server 9.2."

All counties build street networks and improve roads at different rates, but with this system each county may post their own changes to the central state geodatabase based on individual schedules worked out with SHA to meet each participant's workload and timeline.

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