Cadastral Mapping

Spatial Systems Associates, Inc. developed its collective GIS technical expertise and practice on a strong foundation of data creation projects—cadastral mapping being a prime focus. With a history of cadastral data development experience that began well before the establishment of the firm, the principals of SSA are capable leaders in the full-cycle development and project management of cadastral implementations. They are pioneers within the state of Maryland, being responsible for compiling the original Maryland PropertyView Dataset in 1993 and the cadastral maintenance procedures still being used by the Department of Planning, numerous state agencies, local governments, and private subscribers.

SSA has an extensive background in managing and executing all phases of the data creation process. This includes: full data creation workflow, including geodatabase design and cooperative modeling to ensure the compatibility of data within larger scale systems; comprehensive Quality Control/Quality Assurance, including topology checks to enhance the usability of data within computational and geo-statistical models; and detailed documentation and reporting, facilitated by our custom designed project tracking websites incorporating web-based GIS. SSA has used web-enabled tools in all of our major projects. It has proven invaluable in promoting transparency and communications during the course of project execution.

The following capabilities are offered for a typical cadastral exercise:

- Geodatabase Design/Cooperative Modeling
- Web Based Project Management and Tracking
- Scanning
- Georeferencing
- Data Conversion/COGO
- Quality Control/Topology Assessment
- Data Maintenance and Updating
- Attribution and/or Database Linkage
- Web-Enabled Document Management
- Metadata Creation

Jurisdiction	Number of Parcels (Estimated)
State of Maryland	2,000,000
St. Mary's County, MD (update)	2,100
Somerset County, MD	17,000
Worcester County, MD	42,000
Washington, DC	175,000
Charlottesville, VA	15,000
Fairfax County, VA	45,000
Richmond, VA	150,000

SSA has groomed a long term, stable workforce, and **all** technical staff have extensive experience with cadastral GIS development. Our team members have worked together on many cadastral projects. They carry out the work processes, use and develop tools and QC approaches, and can communicate with each other and clients about the contextual information of land ownership records and the technical processes and functionalities of GIS technology.

SSA strives to produce the highest quality data and maintains that Coordinate Geometry is the preferred method of parcel vectorization when the appropriate documents and resources are available. We have a tiered hierarchy of vectorization methods, depending on the source information for a particular location. If documentation does not support COGO methods, we will resort to secondary methods of data creation, including a "best fit" approach—georeferencing available tax maps over the orthophotography and/or georeferencing other parcel source documents. SSA has developed over 225,000 parcels with the Coordinate Geometry method. We have also developed and utilized GPS-based field data collection processes for use when no reliable or limited hardcopy cadastral product is available

Our skills are demonstrated by the successful completion of the various projects our firm has carried out. We are proud of our firm's record of establishing long term relationships with clients based on their satisfaction with our performance.

Washington, DC

DC recognized the pressing need for the development of a vector cadastral dataset. SSA's prior experience in developing Maryland PropertyView contributed to the firm's selection to carry out a pilot program to develop a vector dataset.

SSA was selected through competitive procurement to develop a pilot project for the development of a vector cadastral layer for the District of Columbia and then again selected to carry out the full conversion of all record lots in the District. SSA reviewed source documentation, DC staff skills, and the ongoing data maintenance challenges. After SSA completed the pilot project, the firm completed the vectorization of the 170,000 record lots in the DC property database.

Our production process included close consultation with the District Surveyor to ensure that adjustments required to permit polygon closure in the COGO environment met the District's accuracy standards. SSA served the DC government under a series of contracts between 1998 and 2008.

Fairfax County, VA

SSA was selected through a competitive procurement process in 2003 for a three-year term and then again in 2006 for a six-year term to support Fairfax County's GIS program. SSA developed a countywide storm water easement layer using plats downloaded from the county's CPAN system. The features were created using COGO techniques, and SSA technicians created not only the easements, but also the surrounding parcels to ensure data quality.

This large project included a separate firm to research and organize the tax documents which were funneled to SSA technicians during location-specific phases. To facilitate communications, SSA hosted its project tracking website, to serve the actual GIS data in real-time and allow all users from SSA, our partnering firm, and Fairfax County government to address issues, check on progress, and provide for transparency and accountability among all stakeholders.

City of Richmond, VA

Following completion of a complete needs analysis and cost/benefit study for the City of Richmond, SSA was selected to develop a variety of new citywide datasets, including the cadastral layer. Available hardcopy documents were scanned and registered to new digital orthophotography. The resulting overlays were then vectorized utilizing COGO techniques, and the parcel polygons were linked to available ownership and assessment records. In addition to the cadastral, SSA was responsible for development of new attributed and addressed street centerline files that have become part of the City's GIS dataset.

COGO

Coordinate Geometry is based on methods using the standard spatial reference of the original survey documents and the target dataset to convert surveyed coordinate information into GIS data.

It allows for the user (the technician) to rectify plat information directly into the GIS by inputting distance and bearing information to construct the parcel boundaries. Additional tools allow for rotation of features to align with neighboring parcels (no stretching or scaling occurs).

SSA has also built custom tools to help in the creation of parcel data, including an attribute transfer tool, insertion of hyperlinks to source data, and several semi-automated QC processes.
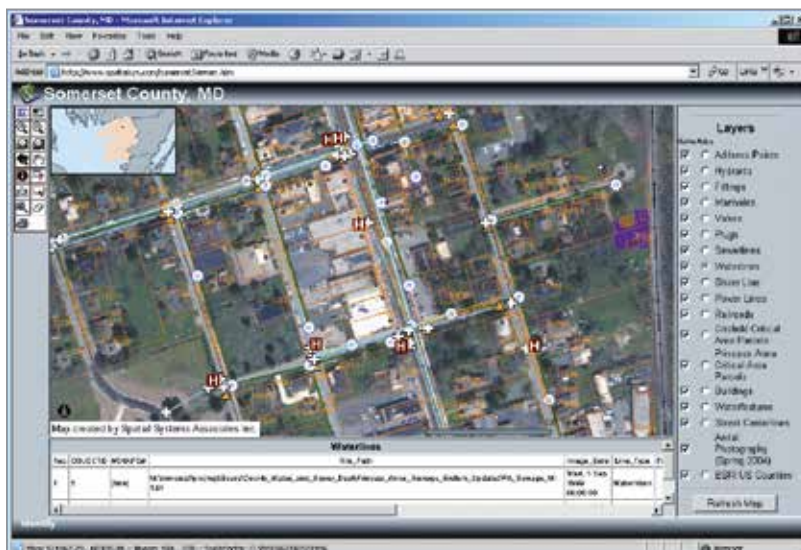
Worcester County, MD

As part of a larger 911 Mapping project, SSA developed a vector cadastral layer for Worcester County primarily to facilitate address maintenance. SSA staff used subdivision plats and SHA right of way plats from plats.net, using COGO techniques as the priority source of cadastral data.

Tax map derived parcels were best fit around the more authoritative data. Our technicians used the County's one-foot pixel resolution orthophotography as the base to which the source documents were registered.