David & Geo-liath:
How Maptitude Wins Big Mapping Battles

Summary

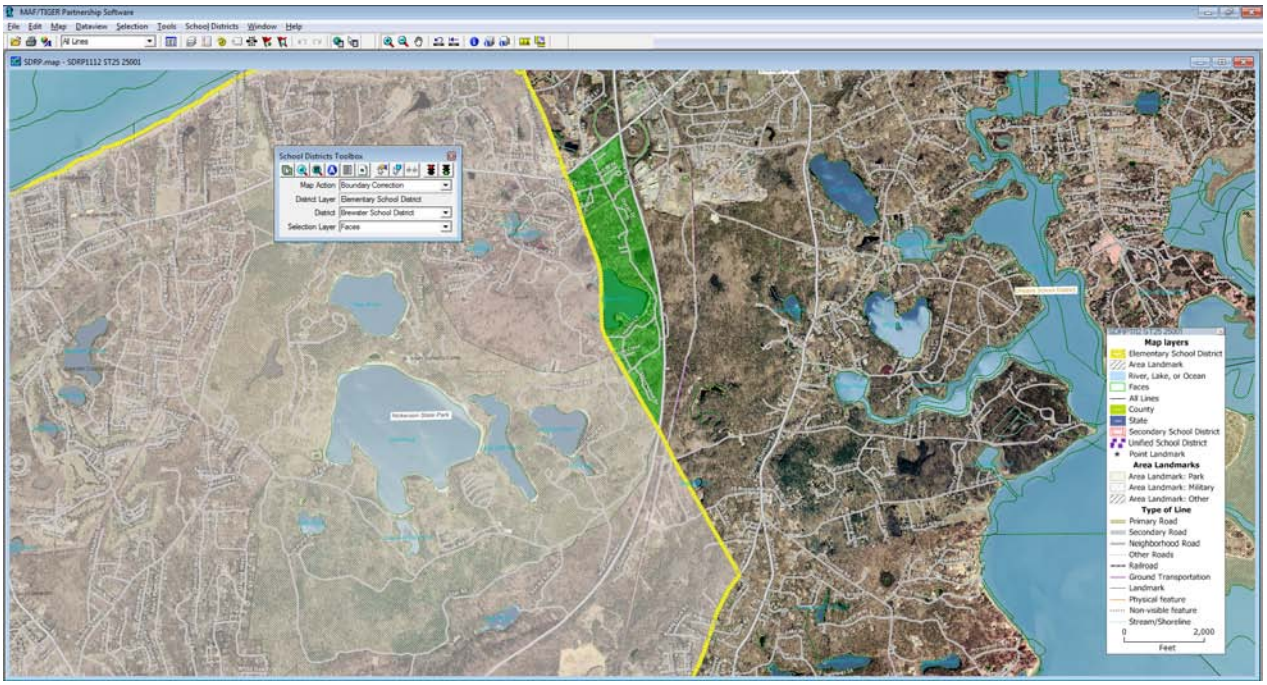
In this article we look at four large geospatial problems each of which were decisively overcome with use of Maptitude mapping software. Maptitude has faced big competition in the geospatial industry and has successfully tackled large-scale software implementations. Maptitude has done this through affordable and efficient solutions that improve decision making and protect the bottom line for businesses, government agencies, and individuals alike. Maptitude, like David, had existed as a relative unknown but is now at the forefront of mapping software innovation with far reaching benefits for many Americans.

United States Census

Because the objective of the Census is to collect a questionnaire from every address, the accuracy and completeness of the Census Bureau's Address List is critical to a successful survey. To support the 2010 Census, the Census Bureau implemented a Maptitude-based solution, named MAF/TIGER Partnership Software (MTPS), which combined the Census address lists (Master Address File or "MAF") and nationwide digital maps (the "TIGER" map) in a single software package to ensure an accurate decennial Census for our communities.

Over 40,000 state, local, and tribal governments had access to this software, to make updates that were essential for the success of the 2010 decennial population Census. Many subsequent activities depend on this process, such as congressional, state legislative and local redistricting (see below), the allocation of federal funds to local and state governments, and the publishing of Census data.

Two Maptitude web-apps were also released that enabled Census Bureau staff and program participants to use Internet browsers and mobile devices to validate and revise geographic updates and jurisdictional boundaries. These applications were particularly useful to agencies that were using paper maps and did not have existing digital data or the ability to install software locally.



The Maptitude mapping software U.S. Census Bureau GIS Interface ©Caliper Corporation

There are a number of reasons correct Census data are important to you. Census data are used not only to apportion seats in the House of Representatives but also to appropriate federal monies in over 1000 programs administered by 26 federal agencies. Most of the funds for these programs are distributed by formulas that use Census data such as total population, population by age group, gender, income, and housing characteristics. For instance, the 2010 numbers are used to decide how more than $400 billion

per year is allocated for infrastructure projects, such as new hospitals and schools, and services like job training centers.

Census data also provides the statistical support for grant applications that fund community social, economic, and environmental programs as well as other community improvements and enhancements. Census data helps your town to plan for future needs. For example, if Census data reveals that your community has a growing number of individuals nearing retirement age, you may have a future need for more assisted living options.

The Maptitude-based solution enabled the Census Bureau to meet a number of additional specific goals such as reducing or eliminating the production, shipping, and handling of paper maps; making participation more convenient; reducing processing cycle time; and improving the accuracy of the Census geographic databases.

Political Boundary Redistricting

The Census Bureau counts the number of people living in the United States every decade, and the results support political boundary revisions. The primary reason for the establishment of the Census is set forth in the U.S. Constitution. The Constitution requires a population count to serve as the basis for the apportionment among the states of the members of the U.S. House of Representatives, with the provision that each state must have at least one representative.

Congressional districts are ***reapportioned*** among the states using a formula based on each state's population and the total population of the country, and is simply a mathematical calculation.

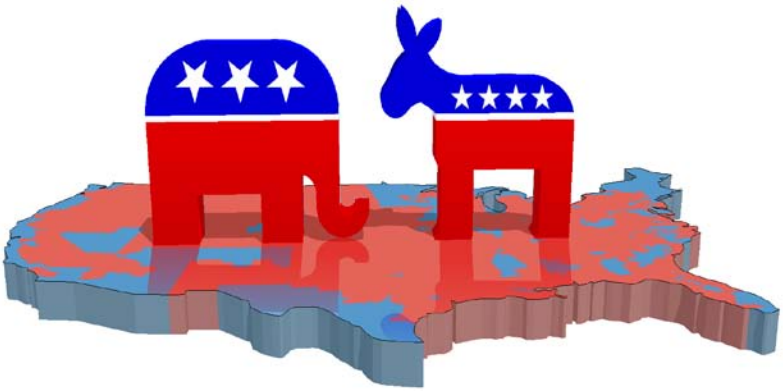


Illustration ©Caliper Corporation

Each state then ***redistricts*** to divide the state up into equal population districts. The widespread use of redistricting software has made the drawing of redistricting plans easier from a technical perspective, but changes to the data and the political and legal landscapes conspire to make the redistricting process at times contentious. Maptitude for Redistricting is a version of Maptitude designed to meet the needs of those involved, and is used by almost all state legislatures, political parties of every stripe, and public interest groups (More…).

Designed with the help of redistricting professionals and other stakeholders, Maptitude for Redistricting has a comprehensive set of the features that redistricters need. Redistricting plans are designed with all kinds of objectives and each state has its own standards for creating Congressional and legislative districts. In addition to equalizing the population of districts and complying with Federal requirements,

criteria may include attempting to create compact districts, trying to keep political units and communities within a single district, and avoiding the drawing of boundaries for purposes of partisan advantage or incumbent protection. In the states where the legislature or other partisan body is in charge of redistricting, the possibility of gerrymandering (the deliberate manipulation of political boundaries for electoral advantage, usually of incumbents or a specific political party) can make the process politically contentious, especially when the majorities of the two houses of the legislature, or the legislature and the governor, are from different parties.

While there have been attempts to completely automate the creation of districts using non-partisan computer algorithms, a 2010 paper in the Duke Journal of Constitutional Law & Public Policy, Micah Altman and Michael McDonald argue that with only a small handful of variables the redistricting problem becomes incredibly complex very quickly, so complex that it is "probably impossible to create a computer program that [automatically] solves these problems optimally and reliably except in very small or limited cases."

Human intervention in the process is currently the best way to redistrict, and Maptitude supports the production of defensible, reproducible, and consistent plans, based on a robust software implementation that adheres to the standards and data required by the plan creation process. Maptitude cannot prevent intentional biases that may be introduced into plans, but does enable serious non-partisan opposition to be mounted to proposed districts, while enabling redistricting bodies to robustly defend new delineations.

Transportation Infrastructure Planning

Transportation planning recognizes the critical links between transportation and other societal goals. The Maptitude family, which includes TransCAD transportation planning software, is fundamental to the planning and management of the nation's infrastructure. TransCAD is a GIS-T (Geographic Information System for Transportation) that has all of the features of Maptitude plus modules specific to the task of transportation planning.

Caliper Mapping Software 3D Transportation Map ©Caliper Corporation

Critical to the transportation planning process are Traffic Analysis Zones (TAZs) which are geographic areas delineated by state and metropolitan planning authorities. TAZs contain annual counts of traffic-related statistics such as place of work and journey to work data. A Maptitude-derived solution was developed for the Census Bureau that makes it easy to define, review, verify, and correct traffic boundaries, and is free-of-charge to designated users.

These traffic zones are used to model future planning scenarios (Regional Transportation Plans or "RTPs"). TransCAD is the dominant package in the United States used to build these long-term transportation system blueprints. The aims of an RTP are wide-ranging, simply because physical infrastructure is fundamental to human activity. Transportation systems shape an area's economic health and quality of life. Not only do they provide for the mobility of people and goods, they also influence patterns of growth and economic activity by providing access to land. The performance of the system affects critical public policy concerns like air quality, environmental resource consumption, social equity, land use, urban growth, economic development, safety, and security. TransCAD is a vital tool in enabling policy makers to make informed decisions on these issues and on the future of the transportation system.

Business Mapping Software

Since 1995 Maptitude has been helping businesses of all sizes cost-effectively realize the benefits of location-based analysis normally limited to large corporations. Maptitude provides a way to extend the capabilities of all business analysts. With a focus on usability, Maptitude has consistently been labeled as the easiest-to-use professional mapping software (read reviews here.)

Client, territory, and geo-tagged information are an organization's greatest asset, and it has often been shown that over 80% of company data has a mappable component. Maptitude allows you to fully realize this potential by helping organizations to make informed decisions through a better understanding of the geography of their markets.

Maptitude mapping software running on tablet mobile device
Photo ©Caliper Corporation

Despite the extensive functionality, a casual user can easily learn Maptitude. In most instances the software will automatically accommodate novice users, while providing experienced users with the flexibility to customize analyses and results. Maptitude is a capable mapping package and should handily meet the needs of all but the most esoteric applications.

Maptitude has a variety of licensing models ranging from single usage to Cloud access. As an Enterprise GIS (Geographic Information System), Maptitude allows widespread use of mapping software throughout an organization, where multiple users can manage, share, and use geographic data for analysis and presentation. Also, Maptitude for the Web applications are accessible via browser-based interfaces on mobile devices.

The Maptitude product suite is not limited to the USA. There are now **19 Country Packages available** covering: 3 of the 5 fast-growing BRICS economies (**Brazil**, **South Africa**, **and India**); 6 of the Group of Seven (G7) nations (including the **USA**); and 12 of the Group of Twenty major economies (including **Australia**).

Maptitude starts at only US$695 and is packaged as a one-stop-solution. Maptitude remains the most competitively priced professional mapping software available and is unique in the marketplace for the provision of comprehensive data and functionality in a single product for a single low price.

Conclusion

Maptitude has influenced the lives of every citizen of the United States and supports the bedrock of our democracy through a broad range of programs that encompass elections, community services, infrastructure, and business planning. The versatility of the software has saved tax-payer dollars and continues to improve the operational efficiency of the country. Maptitude has a price point that cannot be beaten by other players in the burgeoning geospatial industry, a sector that is worth up to $270 billion per year (http://google-latlong.blogspot.com/2013/01/mapping-creates-jobs-and-drives-global.html). Like David, Maptitude has been used to solve and overcome many giant challenges and continues to shape the nation for the better.

About Caliper

Caliper Corporation develops state-of-the-art Geographic Information Systems (GIS) software. With a focus on usability, Maptitude is designed to be a cost-effective, professional mapping software product. Maptitude enables organizations to leverage their location-based data to improve decision making and planning, while minimizing expenditure through competitively priced solutions.

Caliper is a privately held corporation and is a leading developer of mapping, redistricting, transportation, and GIS software.

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