

ESRI UC Paper 1208  
Simplify for Success: Using ArcGIS Engine to Simplify Data Management

**Abstract**

The City of Auburn, AL has simplified data management by embracing technology made available through the ArcGIS Engine Developer Kit and VB.NET. The City of Auburn's GIS Division is streamlining the maintenance of a normalized enterprise database by allowing the owners and users to edit the database directly. These edits are managed via targeted custom applications developed in-house. Management is simplified by programming database permissions and data entry constraints into the applications. These applications streamline the editing process by condensing a typical four step editing process into one simple step thus saving time and money for the City of Auburn.

**Paper**

The City of Auburn, AL (population 50K permanent residents and 25K college students) has utilized ESRI's line of GIS products for approximately ten years. Three years ago the efforts to maintain an effective GIS were centralized within the Information Technology Department to form the City of Auburn GIS Division. At that time the City moved away from simple departmental GIS installations and project work to implement an enterprise GIS. The fundamental premise of an enterprise GIS (as defined by the City of Auburn, AL) is rooted in two main concepts: centralized GIS data and centralized GIS personnel. Utilizing this model offers each department much greater benefit than previously possible. Centralized GIS data benefits the City by enabling us to establish and enforce data standards, eliminate duplicate data, and provide easy access and control of data to all departments. A centralized data environment also allows for much broader and varied use of the data and provides for better integration of departmental data. A centralized GIS staff benefits the City by enabling us to employ higher quality GIS professionals, it allows City personnel (the GIS users) to focus on job specific tasks instead of concentrating on learning complex GIS applications, and helps coordinate GIS work for maximum effectiveness which minimizes the cost of GIS and eliminates duplication of effort. This separation of user duties from GIS duties allows the GIS Division to focus on the advancement of GIS technology city-wide. This model provides the mechanism for assisting City personnel with custom tools tailored to their specific user duties while directing more complex, GIS duties to the GIS professional. Through the City's adoption of the centralized model, we facilitate three of our four goals. Goal 1: Advance GIS technology within the City of Auburn. Goal 2: Establish and enforce GIS data standards. Goal 3: Assist City personnel. Effective

implementation of the GIS Division's fourth goal (allow GIS users to do their job without having to be GIS professionals) is predicated on realizing the first three goals. A GIS user can be defined as a non-GIS professional that comes from a wide range of disciplines and includes not only city staff but citizens as well.

The centralized environment sets the stage for an effective data management scheme called "user editing". This model provides a user, with access to our in-house developed editing tools, the ability to manage data relative to his or her departmental needs. The City of Auburn's GIS Division adopted the use of VB.NET with the ArcGIS Engine Developer's Kit to streamline the management of the enterprise database through the creation of custom editing applications that are programmed to automate complicated editing processes that normally consist of carrying values across multiple tables and feature classes. These custom editing applications simplify the management of a normalized database by allowing the owners and users of the data to edit the database directly while relying on the database and the custom application to ensure data integrity. The first custom editing application created in this environment was an address editor. Although a similar application already existed in the ArcEditor/VBA environment, we wanted to take advantage of the Visual Studio.NET IDE and the additional controls provided by the ArcGIS Engine Developer Kit to create a more robust and targeted application. The address editing application (along with multiple other editing applications we have created) enables users with little to no GIS experience to update, add, or delete geographic information with no more than 15 minutes of training.

Before implementing the user editing model, the GIS Division was responsible for updating all City GIS data; this of course included address information. The following is an example of the former procedure for address maintenance. Step 1: The Planning Department would assign an address to a parcel, generate a parcel map, and write the address numbers on the map. Step 2: The Planning Department personnel would send the map containing new addresses to the GIS Division. Step 3: The GIS Division personnel would enter the new addresses into the GIS. Step 4: The Planning personnel would QA/QC the address updates.

This process would normally take a number of weeks to complete, and it was not uncommon for information to be misplaced or damaged during the transfer of data. More importantly, this old process invited duplication of effort and fostered a lack of trust in the GIS data held by the rest of the City Departments. A single error at any step resulted in the entire four-step process being repeated. The duplication of effort was costly to the City, especially when compounded by the same process being used for the numerous other layers maintained by the GIS Division. When

GIS personnel who know little of the City's addressing scheme updated addressing information (or any geographic information) the data was tagged as semi-reliable by the rest of the City (and understandably so) because of a perceived careless data entry process, however, personnel in the GIS Division saw the problem as a flawed data management scheme. GIS personnel recognized that their expertise was in GIS and not in the various disciplines for which they were making the edits. Why couldn't the editing process be accomplished closer to the source of the data? The solution was the introduction of user editing via targeted custom applications. This model reduced the four step process to one simple step: Planning personnel use the address editing application to assign addresses to a parcel in the GIS.

This method of managing geographic information provides for more efficient use of City resources because it decreases the amount of time taken to update geographic information by eliminating duplication of effort and by greatly diminishing time spent on the QA/QC process due to the fact that the data is entered by the personnel most familiar with the physical location and attributes of the feature. It also produces more reliable data because the users of the data are performing the maintenance and have taken ownership of the geographic information. Any incorrect attributes are the sole responsibility of the department charged with managing that particular set of data. Through this model of providing custom editing applications in the user editing environment the GIS Division personnel are free to pursue the goals of advancing GIS technology for the City, establishing and enforcing data standards, assisting City personnel, and ultimately allowing the GIS users to complete their jobs more accurately and efficiently without having to become GIS professionals.

The centralization of GIS data and GIS personnel along with the technology provided by ESRI with the ArcGIS Engine Developer Kit enabled the City of Auburn, AL GIS Division to be awarded a Special Achievement in GIS Award at the 2004 ESRI International User Conference. Since this time we have created an array of user friendly tools that have improved the quality and quantity of work completed by City personnel by improving upon data access, usability, data integration and user services. The centralized model has allowed our GIS professionals to concentrate on the GIS tasks for which they are best suited.