Oak Bay Succeeds with the Geodatabase

The District of Oak Bay, a small municipality of approximately 18,000 people on southern Vancouver Island, first became involved with GIS in the mid-1980s as part of a total solution for integrating engineering field survey data with a facility database and mapping system. At that time their objective was to replace their manual record keeping system with a more automated and centralized approach. They were successful in this endeavour and continued to move forward with GIS, transferring their data from a legacy system to the ESRI coverage model in the late-1990s. Today, the District’s water and wastewater data is stored in a personal geodatabase and they are recognizing tremendous benefits from using this model.

“When ESRI released the geodatabase we saw an opportunity to migrate our facilities data, which was stored in the coverage model, to an object-oriented data model,” said Steve Garner, Information Systems Officer, District of Oak Bay. “The interface and data modeling capabilities for geodatabases in ArcGIS were easy to learn and use, and the entire process only took about two weeks, from design and testing, to data loading and the beginning of production editing.”

Several benefits of the geodatabase model were immediately obvious to the District. The model is able to relate geometries of different types, such as points and lines, something that could not be done easily using the coverage model. The model supports complex relationships and rule-based editing, and domain values can be assigned to features.

The District decided that the personal geodatabase would provide a cost effective and efficient way to store their spatial facilities data. It would satisfy their current requirements and keep the cost low but still allow them to leverage the intelligence of the geodatabase model. They will also be able to migrate easily to a multi-user system, using ArcSDE, when the need arises.

“Our first priority was to get the underground infrastructure into a personal geodatabase to take advantage of the many benefits of working with an object-oriented data model,” said Mr. Garner. “We examined the ESRI Sewer/Stormwater model and found it was a relatively good fit with our objective.”

Together with industry experts from the user and business partner communities, ESRI has developed several ArcGIS Data Models that provide a practical template to help jump-start projects with a standard, flexible model. The District used the structure of the data model from their legacy system to help them adapt the ESRI Sewer/Stormwater data model for use in their geodatabase implementation.

Building the model involved a series of meetings with field staff to make sure the model fit with the District’s practices and procedures. Once the concept for the model was finalized, the ESRI model was fine-tuned using Microsoft Visio. A repository was exported from Visio and imported into ArcGIS using the Schema Wizard. Next, using ArcToolbox Wizards on the desktop, the data was loaded into a personal geodatabase. After the data was loaded, a few errors in the data model became evident. Luckily, it was easy to go back to Visio to change the model and then repeat the process in ArcCatalog.

The development of the model took about a week including time to review the model, make changes, meet with users, and test the model and the data loading process.

Since the ESRI Sewer/Stormwater model is fairly comprehensive, only about 10% of the model needed to be changed to meet the requirement of the District’s infrastructure, and most of the changes simply involved domain redefinitions. The resulting data model was designed to accept every aspect of the physical structure of their underground networks. When field staff submit detailed data, it is entered into the database, right down to the pipe fittings.

Once the model was complete and had been thoroughly tested, the next stage in the implementation was to load the data and begin editing. At this point, the odd error or inconsistency in the data model did emerge but these were minor and were easily corrected using ArcCatalog, without having to return to Visio. These errors included a missing code value in a domain or an incorrect default value for a field.

According to Mr. Garner, a major benefit of this process was the increased awareness about the District’s data. “I was able to clean up many inconsistencies, mostly incorrect domain values, during data loading. The quality of our data is higher now, and it is more accurate than before.”

Once the data was successfully loaded into the personal geodatabase, it had to be made available to various groups around the municipality.
“Although our data is in a personal geodatabase we still make it accessible to everyone who needs to use it,” said Mr. Garner. “ArcView 8 users have direct access to a published, read-only copy of the geodatabase, and, using tools in ArcCatalog, it is easy to periodically export data from the personal geodatabase to shapefiles, for access by ArcView 3.x and ArcExplorer users.”

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Engineering technologists at the District use the data for project design work, locating services, laying out field surveys, and updating TV inspection reporting data. In addition, there is a computer terminal at the front counter in the District’s Municipal Hall that is used by staff and the public, mostly contractors and real estate agents, to access, view, and print information about properties and the locations of services. The terminal is equipped with a completely customized version of ArcView 3.2 that allows users to access the information stored in the geodatabase.

The ESRI Sewer/Stormwater model was modified using Visio to establish the District’s facilities model.

The District has realized many benefits since implementing the personal geodatabase but by far the most significant has been increased efficiency. Updates can be completed easily and much faster using the new editing tools, and the data is much more consistent. Edits are less prone to user error as a result of rule-modification using Visio to establish the District’s facilities model.

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The City of Calgary, Alberta has gone live with phase one of its assessment project with the successful rollout of a residential assessment solution using NovaLIS Technologies’ Assessment Office. Assessment Office solution now provides complete integration between the City’s GIS, residential property appraisal, market regression analysis, and court scheduling information systems. NovaLIS has also secured contracts with Molpus Timberlands Management (MTM), and Town of Truro, NS.

Geographic Data Technology Canada (GDT), announced the release of Dynamap Canada CompuStreets v. 6.0 featuring increased street and address coverage and enhanced positional accuracy across Canada. TeleType, Inc. has added Canadian street and address coverage from GDT into its TeleType GPS product to provide real-time personal navigation services for mobile devices across North America.

Municipal Software Corporation announced that the Regional Municipality of Niagara, Ontario, expanded its CityView system to include 45 more licenses to bring the region’s total to 50. The Region adopted CityView Enterprise to automate its Permitting Section in 2001. Municipal Software also secured contracts with the City of New Berlin, WI; the Village of Niles, IL; the City of Wheaton, IL; the City of Keene, NH; and the City of Huntington Beach, CA.

DMTI Spatial has launched three new products CanMap® Rail V1.0, a comprehensive digital map database of Canada’s railroad network at the 1:50,000 scale, CanMap RouteLogistics V6.0, and CanMap® Streetfiles V6.0, that includes over 6,900 kilometers of new named street segments and over 2,100 kilometers of new addressed street segments.

INFORM Network for Management Systems announced that the City of Burnaby, BC, has continued development on their ArcIMS application. This application, designed and implemented in conjunction with INFORM, includes functionality that allows users to produce mailing labels for parcel notification. This extends the existing application to meet new business needs. The City is committed to providing business solutions on the desktop through a web based infrastructure.

IDELIX Software Inc. announced a licensing agreement with Boeing Autometric that will integrate Pliable Display Technology™ (PDT) into future versions of Autometric’s data production and mapping products. This commitment ensures the benefits of PDT will be made available to all users of Autometric’s Kork Digital Stereo Plotter (KDSP™) and SoftPlotter® products. In addition, IDELIX has announced the appointment of Bijan Sanii as President and Chief Executive Officer. Sanii comes to IDELIX from Infwave Software Inc., a TSE-listed wireless software company, where he served as President and Chief Operating Officer.

The City of Waltham, MA awarded Govern Software Inc. a contract to implement their next generation enterprise-wide Land Management software solution – Govern for Windows™. In addition to Govern’s Suite, the City also purchased interfaces offered by Govern. The City of Waltham will be implementing a credit card interface to ICVerify, and a meter hand-held interface to Invensys.

Safe Software announced the release of SpatialDirect 2002, a web-based system for distributing and retrieving spatial data either over the Internet or through an Intranet. SpatialDirect users select the data they need using a web browser, then download the data file in a GIS or CAD format of their choice. The software is available with its own HTML-browser interface, or as a plug-in for web-mapping applications, such as ArcIMS.

www.esricanada.com/news/industry-news
ArcSDE

ESRI's ArcSDE software is a GIS gateway that facilitates managing spatial data in a database management system (DBMS). ArcSDE allows users to manage geographic information in a commercial database, and serve ESRI's file-based data with ArcSDE for coverages. ArcSDE plays a fundamental role in a multi-user GIS, serving spatial data to the ArcGIS Desktop (ArcView, ArcEditor, and ArcInfo), and through the Internet via ArcIMS.

Organizations can more effectively administer the storage of spatial data in a DBMS with ArcSDE, so that the growing amount of digital spatial data can be leveraged for an increasing number of GIS users. In an enterprise GIS, ArcSDE provides the infrastructure required to manage multiple users editing the same spatial database. This includes support for long transactions, alternate versions, and history. ArcGIS users can edit ArcSDE layers with ArcEditor and ArcInfo. The ArcMap and ArcCatalog applications provide all the tools required to create, edit, and manage ArcSDE data.

ArcSDE works with a number of popular database systems, including Oracle, SQL Server, Informix, and DB2. ArcSDE works with or without "spatially enabled" DBMS extensions (such as Oracle Spatial, IBM's DB2 Spatial Extender, and Informix's Spatial DataBlade) but can take advantage of these technologies if they are present. These provide a spatial type for data storage, a spatial index mechanism, and a set of spatial operators for search and access. The ArcSDE gateway software allows GIS users to directly store data in any of these spatial types in the DBMS, while providing advanced functionality for database editing, management, and development. DBMS installations that do not have spatial extensions can still use ArcSDE for the storage and management of spatial data in the enterprise DBMS.

With ArcSDE, users will benefit from a significant improvement in the performance of their GIS system by distributing the GIS application between the database server, the client, and the ArcSDE application server. Performance is also enhanced through storage methods that provide a fast and compact representation for spatial data. Additionally, ArcSDE provides the user with database portability. Through data export and import capabilities, it allows for data to be moved from one DBMS to another without loss of information. ArcSDE also allows for schema portability, as users may define a single logical model for spatial data that is independent of the physical database.

ArcSDE provides the business logic software for creating simple geometric data, and also supports advanced GIS data types such as images, networks, and features with integrated topology and shared geometry. Furthermore, ArcSDE allows GIS users to associate features with rules, behavior, relationships, and other object properties, to take full advantage of the object-oriented geodatabase model. ArcSDE also manages the integrity of point, line, and polygon information in the database, preventing the insertion of invalid feature geometry. In addition, ArcInfo 8 and the ArcSDE 8 gateway can be used to implement additional integrity constraints that are not practical to implement in the DBMS itself, such as editing, topology, and connectivity rules.

At ArcGIS 8.1, ArcSDE works with Oracle 8 and 8i, Microsoft SQL Server 7.0 and 2000, Informix, and IBM DB2 Universal Database. Additionally, developers can use ArcSDE as a tool for open access using either ArcObjects or its own Java or C application programming interface (API), for querying and processing spatial information. The ArcSDE server runs on Microsoft Windows NT and Windows 2000 and leading UNIX platforms including Sun Solaris, SGI IRIX, IBM AIX, HP-UX, and Compaq Tru64.

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based editing, based on relationships and domain values. The network analysis tools proved to be a great benefit, as they highlighted topological errors and pointed to inconsistencies in records, which could then be corrected.

From the outset, the data model was built so that it could be expanded and enhanced to include every aspect of the underground infrastructure, and more. The data model was also designed to facilitate the idea of directly linking an inventory system to the GIS. In this way, a facility can be designed in the geodatabase, and a materials list created from the objects involved in the service structure. This list can then be related to an inventory system where the necessary parts would be flagged for a particular project. Although the District is not yet making use of this functionality, they recognize that the future capabilities for their geodatabase are tremendous.

Based on the success of the facilities model the District is looking into the possibility of porting its planimetric and parcel data over to the personal geodatabase. The District is currently exploring the option of moving to a multi-user geodatabase, which will allow them to increase the involvement of other departments in GIS and expand the use of the geodatabase throughout the municipality. They are also investigating an ArcIMS solution connected directly to a multi-user geodatabase. An ArcIMS site would fulfill the needs of the public and District staff who require access to the information stored in the geodatabase. The District of Oak Bay is in a position to build on their success with the personal geodatabase, and can certainly expect to continue to see benefits from their system well into the future.

District of Oak Bay - www.oakbaybc.org