# ArcGIS as Information Portal for Town of West Springfield, Massachusetts

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**Abstract:** *Getting information quickly, efficiently and sharing them with other departments are very crucial for local government. Using ArcGIS as a gateway to information made that a reality for Town of West Springfield, Massachusetts. Spatial data are organized in Personal GeoDatabase and non-spatial data are maintained in department's own databases in Oracle, MySQL or MS-Access. ArcMap and ArcIMS, with customized interfaces and Java/VBA functions, connect databases such as Tax database, Permit database etc. using ActiveX Data Objects or JDBC, and help town officials find spatial and non-spatial information from a single platform. ArcMap is extensively customized to search parcels, plans, streets, engineering drawings etc., to open sale deeds, plans, drawings etc. in external applications or add them to map, and to generate reports or create mail merged letters for notification. Now town officials spend more time on decision-making and less for information searching.*

Even though it is a small community in western Massachusetts, the town is not far behind of using computer technology in its daily businesses like payroll, public works, emergency management etc. To organize and access information quickly, departments store their data in databases. In addition to that, GIS was introduced to the town in 1998 to benefit the town employees with spatial analysis capabilities. Since then, GIS has been playing important roles in town's daily business.

Aerial flyover and field surveys were conducted to create GIS database from the scratch. Initially spatial data were stored both in coverage format, for maintaining topological integrity and in shapefile format, for faster access over the slower network, and ArcView 3x was customized with user-friendly dialogs. With the availability of ArcGIS 8.3 and faster network, town GIS was switched to object oriented Personal GeoDatabase format and to ArcMap for better and easier customization.

With tons of data on the server and different interfaces to access them seemed little overwhelming to municipal officials. To share these information between departments, an in-house project was initiated - ArcMap was chosen for development platform and customized as a gateway to information that are directly or indirectly related to geographic features. ArcMap provides options to search parcels, plans, streets, engineering drawings etc., to open sale deeds, plans, drawings etc. in external applications or add them to map, and to generate reports or create mail merged letters for notification from one single

platform. Now town officials can spend more time on decision-making and less for information searching.

## West Springfield Municipal Information System (WSMIS)

WSMIS is a customized information system developed on top of ESRI software and designed to provide information to users' fingertips. It consists of 3 major components:

❑ Customized ArcMap for municipal officials
❑ ArcIMS sites for public access
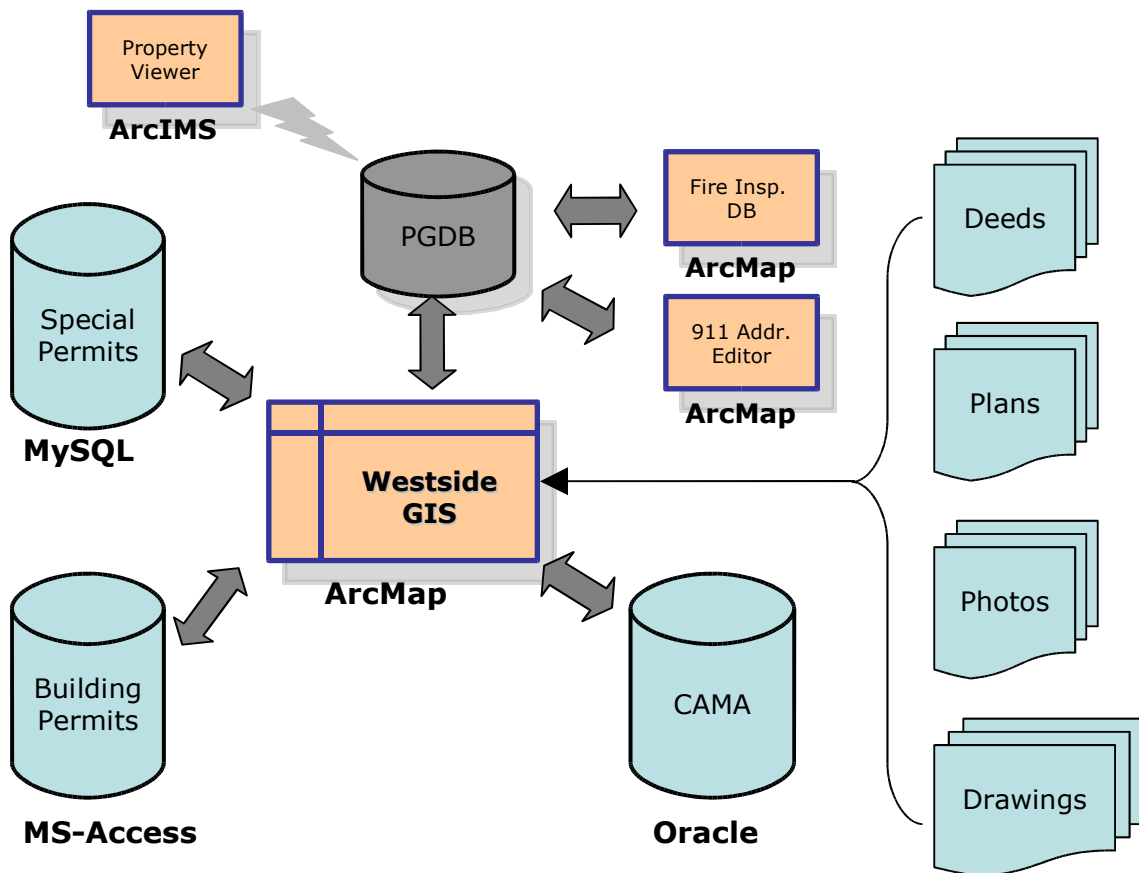❑ MapObjects and ESRI MapControl based 911 Emergency Management System

**Figure 1: Municipal wide Information System**

An ArcMap template document is created and extensively customized with ArcObjects in VBA environment. End user uses default ArcMap document or may create another one with personal preferences – either way the document is linked with the template that has all tools, forms and ArcObjects codes. This template based system helps to propagate updates to all users' documents. The codes link the document with other external databases in Oracle, MySQL and MS Access via ActiveX Data Objects (ADO). It provides easy interface with drop-down boxes for searching parcels by any address. When a user searches a parcel, it gathers all information linked to that parcel from different databases and presents them in a simple form with photo and links to digital copy of sales deeds and lot plan. User can generate abutters list and export to a different format or open MS Word (directly from ArcMap) for mail merge. At the same time, it is designed to provide an easy access to street information and shows "water tie cards" on a VB form using Kodak Image Edit control. There is a special layer available that checks existences of any special permits or variances for each visible parcels from an external database on the fly and generates labels to flag them using VBScript and ADO.

ArcIMS sites are developed to provide public access to tax and survey information. Since web server and ArcIMS are running on Linux and tax database (on Oracle) on Windows, a cross-platform system is developed using Java, JDBC and JSP (Java Script Page) technology. This makes the system stable, robust and integrated with windows system. ArcIMS sites are also used by infrequent municipal officials.

Enhanced Emergency (E-911) system is comprised of two applications developed using MapObjects and ESRI MapControl to launch quick but well informed dispatch in an emergency situation. It gives detail site information including important points e.g. Location of hazardous materials, exit doors, shut offs etc.

Following sections are descriptions of how the system helps municipal officials in their daily business.


## Parcel Management

GIS is live linked with Tax database to provide up-to-the-minute information to users. ArcMap is customized with Microsoft ActiveX Data Objects (ADO) to get information or to search parcels by owner name, address or IDs directly from
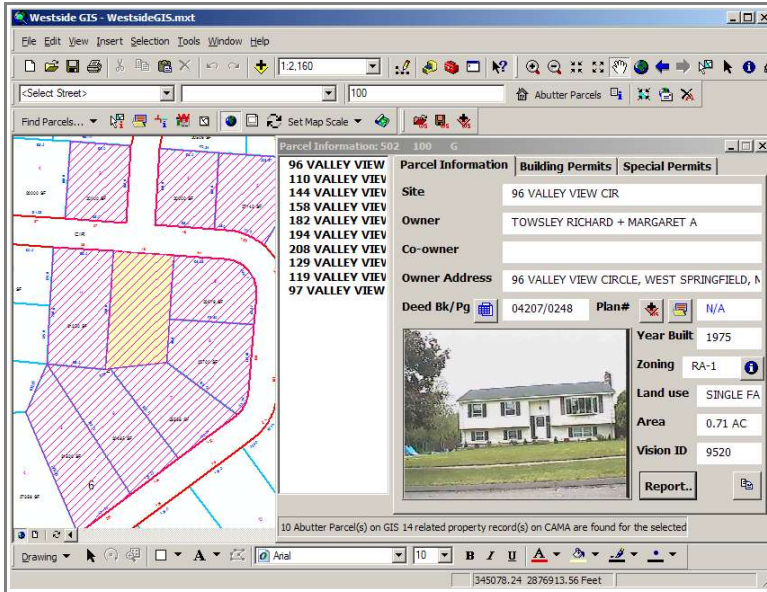
**Figure 2: Find Abutter Parcels**

Tax database that is running on Oracle. Previously, GIS Coordinator used to download all tax information at specific interval into a .dbf file and joined that to parcel layer, and was only be able to perform many-to-one or one-to-one relationship. Now it supports one-to-many and many-to-many relationship thus solves condominium issue where one parcel polygon linked with many condo-units.

Hampden County Registry of Deeds, MA scans sale deeds and approved plans, and sends to the town every month. The plans are geo-referenced and copied on a server along with sale deeds. Since they are linked with GIS system, user can search and view sale deeds or plans directly from ArcMap and overlay plans with parcel layer in ArcMap.

## Permit Database

It is very important for Building Inspectors to check whether permits have been issued to any parcel. They used to open three different applications - ArcView, VISION and permit database to get information like property ownership, photos, zoning regulation, year
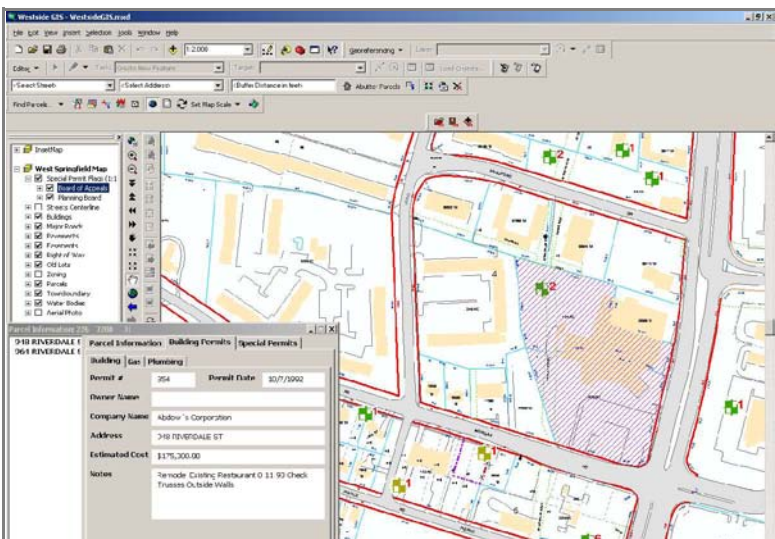


**Figure 3: Information for Permits Databases and Flagged Parcels**

building built, land use etc. and would have to go to numerous departments to gather information. WSMIS has saved the department hours and hours of work by having these information at fingertips. The savings in man-hours, not only for the department but also for businesses, developers, builders and residents of the Town that the department serves is immeasurable.
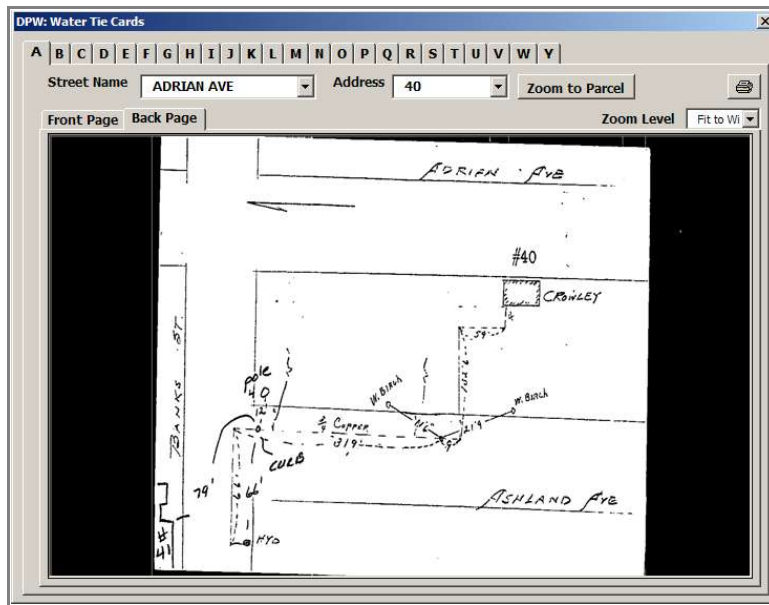
## Engineering Drawings



**Figure 4: Easy Interface for Finding and Viewing Water Tie Cards**

Public works department of the town, one of the biggest users of GIS, has recently scanned all plans, field cards, water tie cards and other engineering drawings, and is in as process to develop a database to let municipal officials and residents search and view them. WSMIS has already been and is constantly being modified to search that database, and display or overlay plans on map. Currently engineers can only find Water Tie cards in GIS by address and can zoom to the parcel, which saves them huge time that would otherwise be spent sorting through the piles of cards. It also saves their trips to town hall as water department is not located in the town hall. Engineers at the water department use high speed remote access connection for GIS.

## Emergency Management

Fire department has been using GIS for 911 calls for few years. MapObjects based "E911 Incident Map" was developed by Applied Geographic Inc., and is connected with 911 phone line and automatically zooms to the location when call comes in and shows site information and distance to nearest fire hydrants.
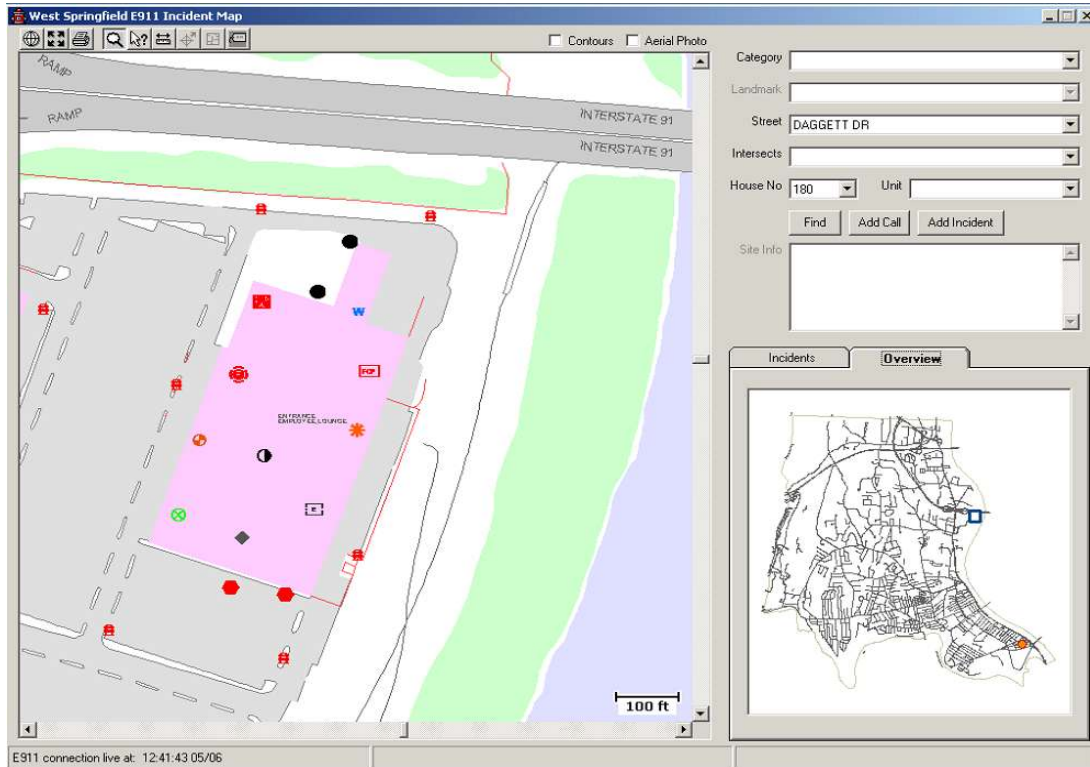
**Figure 5: E-911 Incident Map**

MS-Access based Fire Inspection Database, with embedded ESRI MapControl and simple interface, lets Fire Inspectors add locations of shutoffs, hazardous materials, exit doors etc. which was never possible before. It can export data to "E911 Incident Map", so that fire fighters can view those locations on their computers too and get better idea about the site before being dispatched.

## Public Access and Web GIS

The town always wants to serve the community better. Disseminating public information over the web means residents and business in the town can get their information at their convenience. To start with, two ArcIMS websites were developed – one is Property Viewer and another is Ground Control Points Explorer for surveyors. Property Viewer website, built with JSP pages, connects Tax database via JDBC and sends property information back to the client PC over the Internet. In addition to serving the public, the same website saves town's money on licenses by providing GIS to other town officials who do not have ArcGIS e.g. Town Collector uses the site to search parcels and view sale deeds. It saves Town Collector's trips to the assessor's and Registry of Deeds.
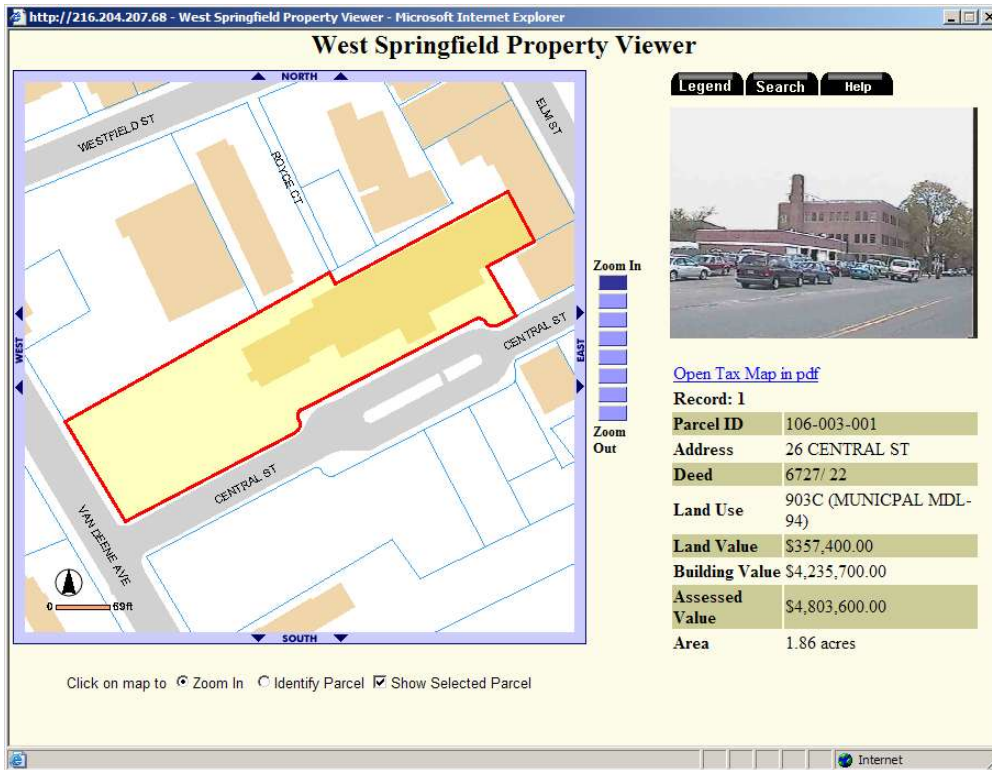
**Figure 6: ArcIMS based Property Viewer for Public Access**

The town GIS department is planning to develop network models for stream, water and wastewater system and tie them to engineering drawing and other inventory databases to do better job more efficiently, and intends to disseminate more public information via Internet to serve the community better.

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