

Parks & Recreation Information System - Integrated ArcIMS Application, Boulder, Colorado

**Don Jensen, P&DS, Information Resources, City of Boulder
Terry Stonich, P&DS, Information Resources, City of Boulder**

Abstract

This paper will outline the goals, process, and results obtained in creating a custom ArcIMS website application for the City of Boulder, Colorado Parks & Recreation Department.

The goal of the project was to develop an information system for staff to assist them with the management of the city's Parks System. The information system utilizes an ArcIMS application that integrates and centralizes access to Park's GIS data, database information, asset photos, and large format imaged documents and plans. The website serves internal Park's staff members with a "one-stop-shop" for mapping data and park information assisting them with planning, asset management, and maintenance activities.

This paper will discuss how ArcSDE, ArcIMS, IBM Content Manager, and a Microsoft Access database were integrated to achieve the project goals. The presentation will also address how web programming was utilized (Flash, JavaScript, JSP, XML, and HTML) to customize and enhance the ArcIMS application interface.

Project Background

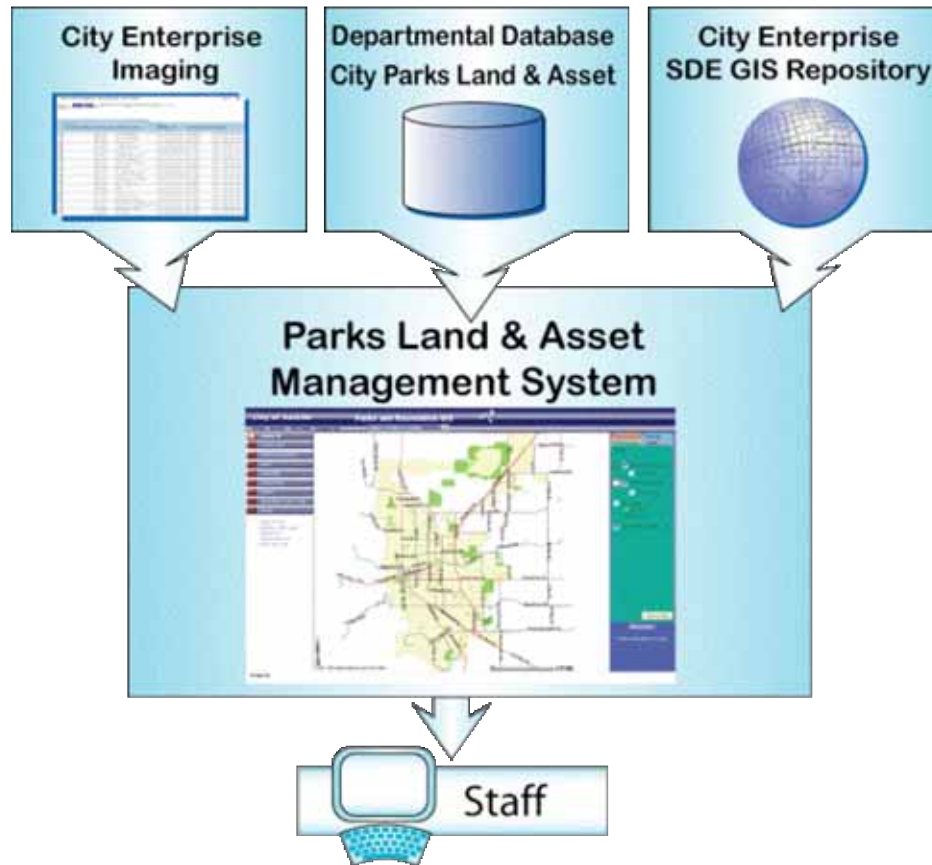
The City of Boulder's Parks System contains over 90 parks of various sizes from large regional parks to small neighborhood pocket parks. There are also two ball field complexes, three recreation centers, a soccer complex and a golf course.

In 2004 the Parks and Recreation Management Team decided the department needed a more efficient system for managing and disseminating Park information to assist staff with the planning, management, and maintenance of the Park's System. These decisions lead to the creation of a team to evaluate options and select a solution.

A project team was formed that included representatives from Parks Planning, Maintenance, and Administration divisions along with staff from Information Resources. An assessment was conducted to define system needs. This included an inventory of existing data and a plan to collect and develop new information. In addition, the team researched a number of potential system options. The information system solution that was selected included a custom GIS application that utilized and integrated ArcIMS, SDE GIS data, MS Access, and IBM Content Manager.

The Parks Land & Asset Management System application was developed using an ArcIMS interface to provide staff with access to all departmental data and information. This solution provides an effective tool for managing and delivering Park information to all staff members via the city's intranet.

Application Concept



Data Development

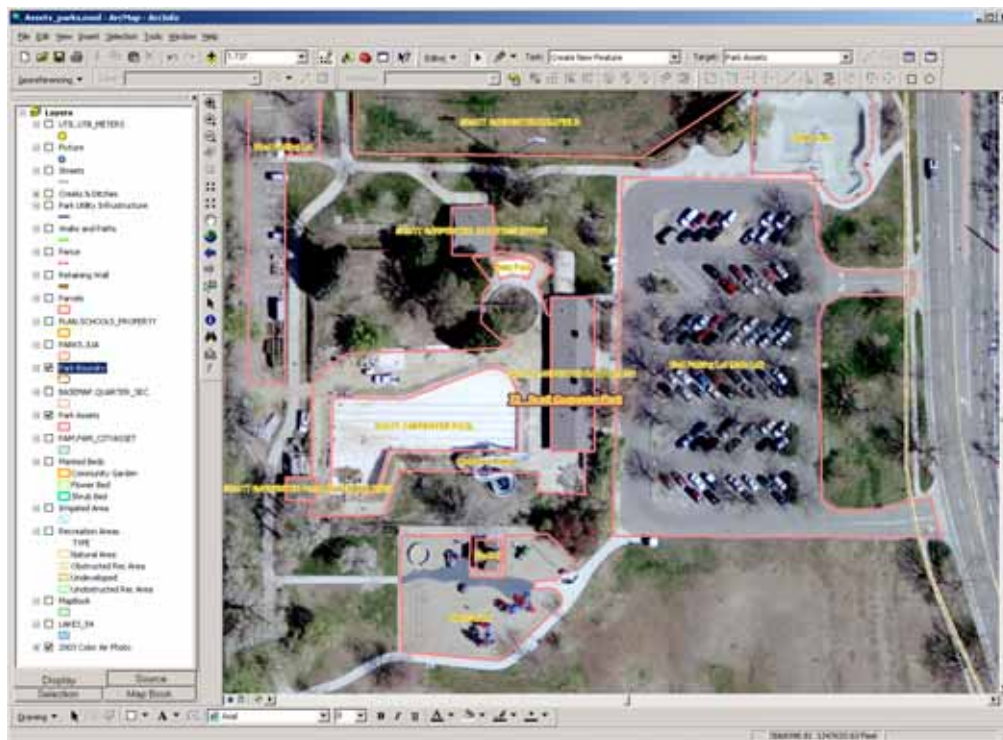
In order to integrate the SDE GIS data, MS Access database information, and IBM's Content Manager application unique ID's common within each application were created, linking all related data and information. This involved creating new GIS data, a new MS Access database, and modifying the IBM Content Manager application.

Access to the 2,400 large format documents and plans that were currently in the city's enterprise IBM Content Manager application were integrated with the system by modifying index fields based on parcel numbers assigned to Park Lands. This allowed staff to access documents related to Park Lands using the ArcIMS application.

The MS Access database was created to be the primary repository of tabular data detailing infrastructure, asset, and park land information. The SDE GIS feature data was joined to the MS Access database attribute information. This allowed Parks staff that had no GIS data editing experience the ability to update the GIS attributes via the MS Access database. In addition, this allowed staff to access the database information using the ArcIMS application.

New GIS datasets were developed in ArcInfo and stored in SDE features for the application. Parks land had been previously inventoried and mapped and this layer was used as the base GIS data for the Parks land layer. Additional GIS layers were created using the city's current aerial photography to digitize structures, buildings, parking lots, and other visible asset. Other GIS layers were developed by site inventories of parks that included fixtures, irrigated areas, recreation areas, planted areas, sidewalks and trails, fences, retaining walls, and trees. Each of these features was given a unique ID and assigned to a unique Park Land ID.

ArcInfo Data Development into SDE



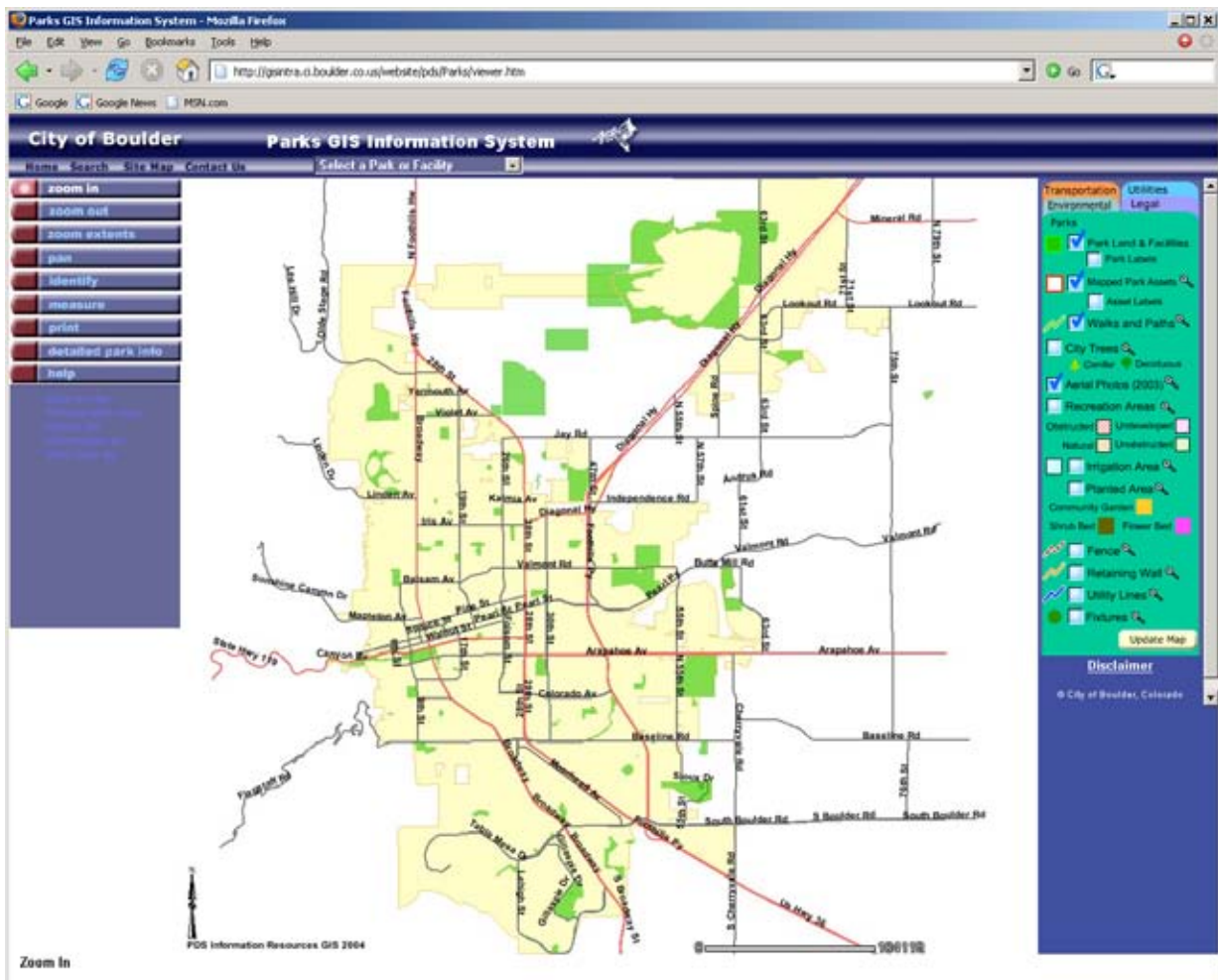
Application Development

ArcIMS:

A customized ArcIMS application was developed to integrate and deliver Park's data and information from a single application. The application utilized a custom ArcIMS GUI developed using XML, JavaScript, JSP, HTML, and Macromedia Flash.

A custom GUI was developed with JavaScript and Macromedia Flash to interface with the ArcIMS map service providing staff with access to mapping and related data. For quick and easy access a pull down menu with an index was built with HTML to query and zoom to specific Park sites. A custom legend with features grouped onto tabs was built using Macromedia Flash allowing users to managed GIS map layers. The ArcIMS identify function was utilized to access feature attributes joined from the MS Access database. Hyperlinks were created that passed custom queries to IBM's Content Manager application to retrieve the Park specific documents and related photographs.

Custom ArcIMS GUI

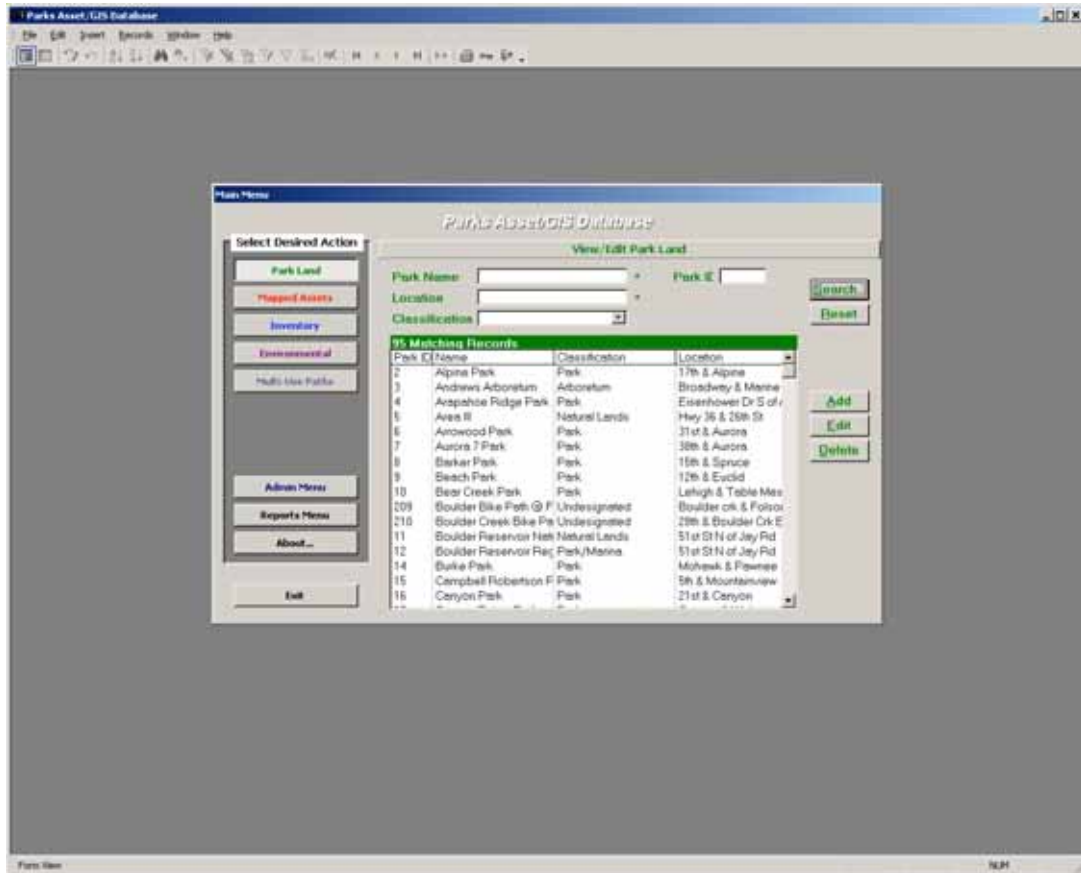


Microsoft Access 2000 Database:

In order to manage, edit, and update Park information a custom MS Access database was developed. This allowed multiple Parks staff to maintain data without having to do the editing in ArcEditor. A synchronizing function was built into the MS Access database to update the SDE GIS features. Once updates are completed in the database the results are automatically shown using the identify function in the ArcIMS application. This functionality provides real time access to

the most current database information using the Park Land and Asset Information System.

MS Access Database GUI



Park Photographs and IBM Content Manager – Document Management:

The ArcIMS application was developed to integrate and deliver Park’s large format documents and photographs. This functionality was created by modifying the ArcIMS identify tool which creates a custom hyperlink query to photos stored on a server and documents stored in IBM’s Content Manager.

ArcIMS Identify



Photographs and Link to Imaged Documents in IBM Content Manager

The screenshot shows a web browser window displaying the City of Boulder website for Greenleaf Park. The browser's address bar shows the URL: http://intraweb.ci.boulder.co.us/buildingservices/parks/parkphotos.php?PARK_ID=42&LABEL_NAME=Gr. The page header includes the City of Boulder logo and the text "Greenleaf Park". Below the header is a navigation menu with links for "Home", "Search", "Site Map", and "Contact Us".

The main content area is divided into two sections. On the left is a "File Directory" section with a list of links: [Default.jpg](#), [MAPPED ASSETS](#), [arbor.jpg](#), [folsom_fence.jpg](#), [lighting.jpg](#), [pearl_fence.jpg](#), [ped_bridge.jpg](#), [play_area.jpg](#), [seating_area.jpg](#), [signage.jpg](#), and [spruce_fence.jpg](#). On the right is a large photograph of a park sign that reads "Greenleaf Park".

Below the photograph is a table of park information:

Park ID:	42	Name:	Greenleaf Park		
Acres:	undefined	Sq Feet:	undefined	Owner:	undefined
Subcom:	Central Boulder	Location:	Not Available	Maint Zone:	Not Available

The browser's status bar at the bottom right shows "Unknown Zone (Mixed)".

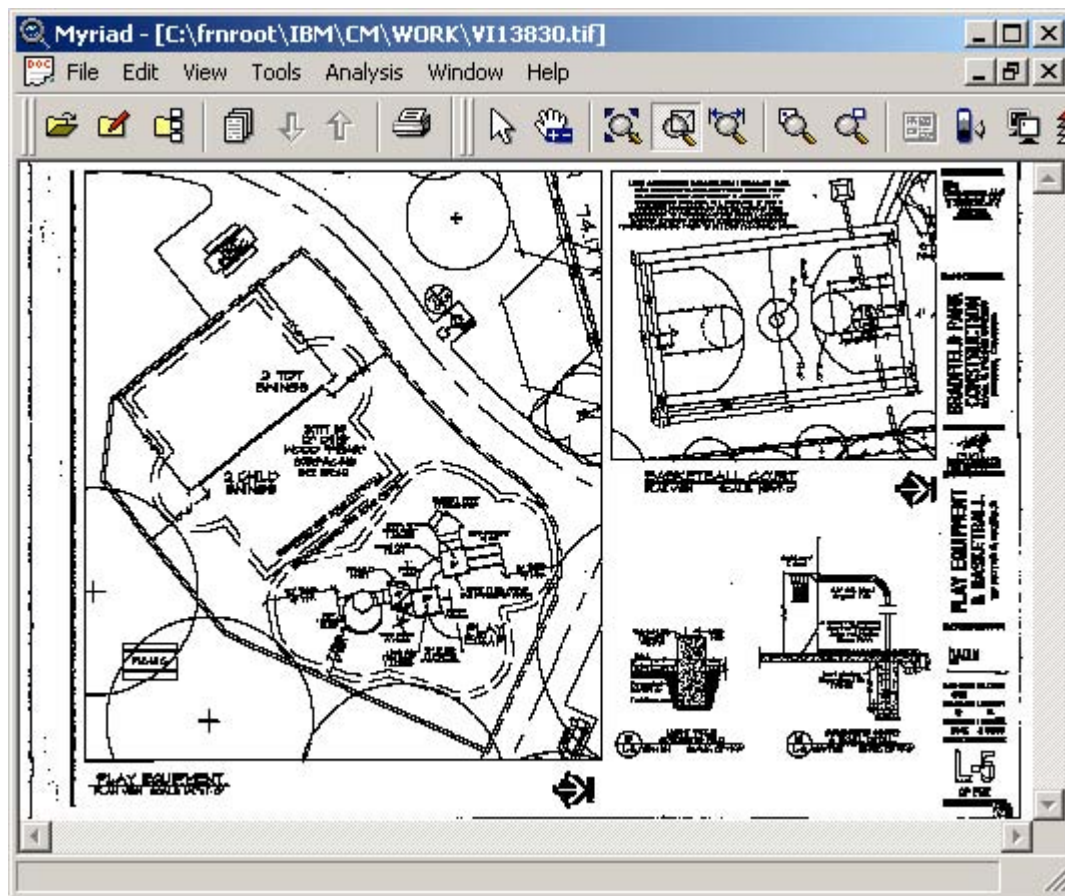
A list of photographs and a hyperlink to search for documents was developed using ArcIMS, HTML and JSP. Also a list of general park information including location, area and maintenance zone is available on the page.

By clicking on the "Imaged Documents" hyperlink a new window will open with the list of documents from the IBM Content Manager application. These documents can be sorted by clicking on the field name and then viewed by selected a specific document.

Document List in Content Manager

Name	Case Number	Address	Project Name	Description	Document Category	Document Type	Document Content
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	PLAY EQUIPMENT	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	LAYOUT & MATERIALS	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	LANDSCAPE & PLANTS	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	GRASSING PLANS	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	ELECTRICAL SITE PLAN	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	ELECTRICAL	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	TITLE SHEET	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	BRIDGE DETAILS	
GREENLEAF PARK GREENLEAF PARK (FORMERLY BRADFELD) *** FORMERLY BRADFELD PARK PARKS & REC					Converted External Scan	CONDITIONS & SPEC	

Sample Park Plan from Content Manager



Conclusions

The Parks Land & Asset Management application has proven to be a useful and effective tool for Parks staff assisting them with the management of the parks system by providing a "one-stop-shop" for Parks mapping data and related information. The application integrates information into an easy to use and access system that allows for the efficient management and delivery of information

throughout the organization. ESRI's ArcIMS is a powerful, cost effective tool that can be customized to develop applications that integrate different data types into effective information management systems.

Acknowledgments:

Jeff Lakey, City of Boulder Parks and Recreation
Matt Claussen, City of Boulder Parks and Recreation
Robin Woodsong, City of Boulder, P&DS, Information Resources
Cam Marshall, Marshall Information Services, Boulder Colorado

Author Information:

Don Jensen, City of Boulder, Planning and Development Services, Information Resources
1300 Canyon Blvd
Boulder, Co. 80302
Ph. 303-441-3297
Email jensend@ci.boulder.co.us

Terry Stonich, City of Boulder, Planning and Development Services, Information Resources
1300 Canyon Blvd
Boulder, Co. 80302
Ph. 303-441-4193
Email stonicht@ci.boulder.co.us