



## Capturing Historic Preservation In Riverside, California

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### ***Abstract***

The City of Riverside Planning Department maintains and updates an extensive database of historic resources that have been surveyed over time including landmarks and historic districts. Putting this information on the city website means citizens, researchers and visitors can search and learn about the history and architecture of residences, commercial and civic buildings, and historic neighborhoods (<http://olmsted.riversideca.gov/historic>). Historic property information includes an interactive map and photographs. The property maps are generated dynamically by ArcIMS. The map images and controls are just one part of the ASP .NET web page. This paper will discuss how the Web application interacts with the ArcIMS map service and some of the important technical issues involved.

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## *Introduction*

With a population of over 285,000 Riverside is the 12th largest city in California. Founded in 1870, Riverside has a wealth of historic resources that tell the story of the city's growth and development and provide a strong sense of place. Through its historic preservation program, a division of the Planning Department, Riverside is committed to preserving the past as a firm foundation for the future.

One of the most important components of a successful preservation program is a survey process to identify, record and designate historic resources over time. Toward that goal, Riverside has surveyed over 10,000 properties since the late 1970s, resulting in the designation of hundreds of individual resources and eleven historic districts. Significant resources include houses, commercial and civic buildings, bridges, trees, and parks.



Historic resources surveys are carried out to record information collected in the field, such as architectural descriptions, photographs and location maps, as well as research data relating to the history and significance of a resource. Standardized forms developed by the California Office of Historic Preservation provide the vehicle for the recordation of the data and are prepared for all properties surveyed. Although the survey record itself represents a static record of a resource at a specific period in time, properties may be surveyed many times over a period of years. In addition, new resources become historic each year as they reach the general 50-year age requirement.

The survey process, therefore, is a never-ending one. By the late 1990s, the City of Riverside realized that the organization of this steadily increasing mass of information in a usable and searchable format was necessary and developed a historic resources inventory database. The database was not only used to record hard copy survey information previously recorded, but was also designed to be expandable. This allows for the incorporation of any number of surveys and designation types on both individual resources and historic districts to provide a complete information history. It is important to understand that this database not only records significant, i.e. designated, resources, but also includes all properties surveyed so it is possible to obtain information on properties not subject to local, state and federal preservation laws.

## **Who Uses This Tool**

When originally conceived, the primary user of the database was City staff. However, it became apparent that this wealth of information would be useful to the public as well. The City then received a Certified Local Government grant from the California Office of Historic Preservation and a software donation from ESRI to develop a website. This product was developed completely in-house as a collaborative effort of the City's Information Systems Department and Planning Department staff.

The overall objective of the website was to make the historic resources information available in an easy to navigate format that would be understandable to a wide range of users. Preservation consultants, for example, may search for previous survey information to incorporate into an environmental study while a homeowner may be interested in knowing the general history of their house or neighborhood. Realtors on the other hand may want designation information to pass on to a potential buyer and a developer may search for similar information to determine if a property is available for preservation incentives. The website can be searched by property address to display all information recorded on a particular property. Photographs and location maps supplement the research data that was prepared as part of the survey process and includes, where applicable, construction date, architectural style, architect, builder, architectural description and discussion of significance as well as other technical information required as part of the state recordation forms. All data fields use the standard terminology used on the state forms. Designation information, where applicable, indicates at what level(s) a resource is designated.

## **How It Works**

The website can be searched by numerous data types in addition to property address. Searching by architect, architectural style, construction date, designation type, and property type can provide information on all properties within the city meeting specific criteria. This also allows for compound searches. For example, a researcher may want to know how many buildings in Riverside a particular architect designed during a defined period of time. To give a specific example, it is possible to determine how many Spanish Colonial Revival style churches were constructed during the 1920s.

Many of Riverside's individually surveyed properties are located within the boundaries of historic districts. Districts are geographically defined areas with a significant concentration of resources that represent themes important in local history. The website features a map that illustrates the location and boundaries of all of the City's historic districts as well as information on the history and development of each using the standardized survey information.

As new properties and neighborhoods are surveyed and designated over time, Riverside's historic resources database is updated. This forward thinking approach to historic preservation helps ensure that the most current information is available to both City staff and the private sector in implementing present and future goals related to the protection of historic resources.

## The Design Issues

The City of Riverside has over 50 individual websites representing different departments or applications that are available to the general public, City Hall employees or both. The City recently adopted a new logo, which required replacing all of the existing web page banners. As part of the process of upgrading the banners, a set of simplified and unified style sheets were also planned, and the revision of the Historic Districts & Buildings website would launch these upgrades.

## The Page Elements

Certain page elements are common to all City websites; the banner, footer, top navigation bar, and search bar. The contents of some of those elements, such as the banner and navigation buttons, may change, but their position on the web pages is constant. Users are better able to navigate a series of common websites when a consistent page structure is used. This can be accomplished by using a common style sheet for page layout so that similar information consistently appears in the same screen areas. The user "learns" where to look on the page to find what he/she needs.

### Page Banner

The banner has two images and an address bar with a link to the City's home page. Structurally it is a two-row table with the top row split into two cells. This allows the website title information and city scenes graphics to be exchanged when used in other websites. The address bar row is text-based and easily modified.



### Top Navigation

The next section is the top navigation bar. It is also text-based and easily modified. The primary style sheet defines the colors, borders and mouseover effects for the buttons giving it a graphical appearance without any of the issues of graphical buttons, which require alternate text tags for screen readers and can be time-consuming to create.



## Smart Search Bar

The Smart Search Bar is a common feature with unique capabilities depending on where it is used. It is reasonable to assume the functionality is implicit to the web page where it resides. Its functionality for the City's home page, for example, would be to search all of the City web pages for matching information. The use of a recognizable page element, even with different functionality, makes it easier for the user to locate it on the page when it is needed.

### ILLUSTRATION 3 – SMART SEARCH BAR

SMART SEARCH	<input type="text"/>	TYPE YOUR SEARCH CRITERIA AND PRESS ENTER	TEXT ONLY WEBSITE
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## The Footer

In addition to providing legal information such as a copyright notice and common links for all City websites, the footer provides a visual cue to the viewer that they are at the end of the web page.

### ILLUSTRATION 4 - FOOTER

<a href="#">Website Disclaimer</a>	<a href="#">Privacy Policy</a>	<a href="#">Contact Webmaster</a>	<a href="#">Riverside City Home</a>
© 1996 - 2005. All Rights Reserved. City of Riverside California.			

## Main Body Piece(s)






Another page element identified as a “main” segment fits between the search bar and the footer. Additional main segments can be inserted here as well if a page requires the display of multiple types of information.

An auxiliary style sheet for each website is added to support the “main” segments of unique websites. In this way, the primary style sheet remains untouched.<sup>1</sup>

### ILLUSTRATION 5 – MAIN SECTION

<b>Style:</b> <input type="text"/>	<b>Address:</b> <input type="text"/>
<b>Builder:</b> <input type="text"/>	Type a street number and name and press enter.
<b>Architect:</b> <input type="text"/>	<b>OR - TYPE AN APN:</b>
<b>Property Name:</b> <input type="text"/>	<b>APN:</b> <input type="text"/>
<b>Original Use:</b> <input type="text"/>	Type an Assessor's Parcel Number and press enter.
<b>Decade Built:</b> <input type="text"/>	This database includes information on both individual properties and historic districts that have been surveyed by the City of Riverside from 1977 to the present.
<b>Designation Type:</b> <input type="text"/>	If your property is not included in the database it does not mean it is not historic -- it simply means it has not been surveyed to date.
<b>District:</b> <input type="text"/>	The City of Riverside acknowledges assistance from public and private agencies who contributed to this effort.
<input type="button" value="Get Results"/>	<input type="button" value="Clear All"/>

 Riverside County Courthouse	 Old City Hall - Riverside, CA	 Fox Theater	 Queen Anne	 Tudor
--	--	--	---	--

## The Assembled Web Page

Assembling these elements into web pages using ASP or ASP.NET server technologies allows the reuse of common page elements.

**ILLUSTRATION 6 – THE ASSEMBLED SEARCH BY PROPERTY PAGE**

**CITY OF RIVERSIDE HISTORIC DISTRICTS & BUILDINGS**  
CITY HOME 3900 MAIN STREET • RIVERSIDE, CA 92522 • 951-826-531

[SEARCH BY PROPERTY](#) | [SEARCH BY DISTRICT](#) | [HISTORIC PRESERVATION](#) | [MAPZONE](#) | [PROPERTY VIEWER](#) | [HELP](#)

**SMART SEARCH**  **TYPE YOUR SEARCH CRITERIA AND PRESS ENTER** [TEXT ONLY WEBSITE](#)

**SELECT PROPERTY BY ONE OR MORE CRITERIA:**

**Style:**

**Builder:**

**Architect:**

**Property Name:**

**Original Use:**

**Decade Built:**

**Designation Type:**

**District:**

**OR - TYPE AN ADDRESS:**

**Address:**

Type a street number and name and press enter.

**OR - TYPE AN APN:**

**APN:**

Type an Assessor's Parcel Number and press enter.

This database includes information on both individual properties and historic districts that have been surveyed by the City of Riverside from 1977 to the present. If your property is not included in the database it does not mean it is not historic -- it simply means it has not been surveyed to date. The City of Riverside acknowledges assistance from public and private agencies who contributed to this effort.

[Get Results](#) [Clear All](#)

**Riverside County Courthouse** **Old City Hall - Riverside, CA** **Fox Theater** **Queen Anne** **Tudor**

[Website Disclaimer](#) | [Privacy Policy](#) | [Contact Webmaster](#) | [Riverside City Home](#)

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## Defining Page Elements With CSS

CSS was used to define the “containers” for page elements. DIV container widths were set at 750 pixels and the elements were centered on the page with borders as defined in this banner style:

```
div.banner {  
    width: 750px;  
    margin-left: auto;  
    margin-right: auto;  
    z-index:40;  
    overflow: visible;  
    visibility: visible;  
    border-top: 1px solid #CCCCCC;  
    border-right: 1px solid #CCCCCC;  
    border-left: 1px solid #CCCCCC;  
    background-image: url(images/style-graphics/bg-banner-div.gif);  
}
```

## Presentation matters . . .

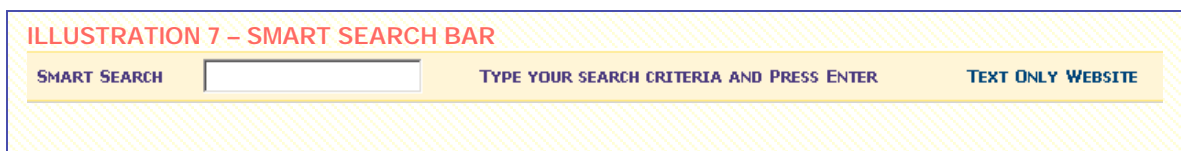
Presenting information and resources in a logical manner helps the user find what they are seeking and encourages him/her to linger. Good graphics, good navigation and a logical flow of information and resources all help keep the user’s eyes on your pages.

## Searching the Historic Districts & Buildings Website

Three search avenues are provided in the HDB website with the use of any one of the search capabilities excluding the functionality of the other two.

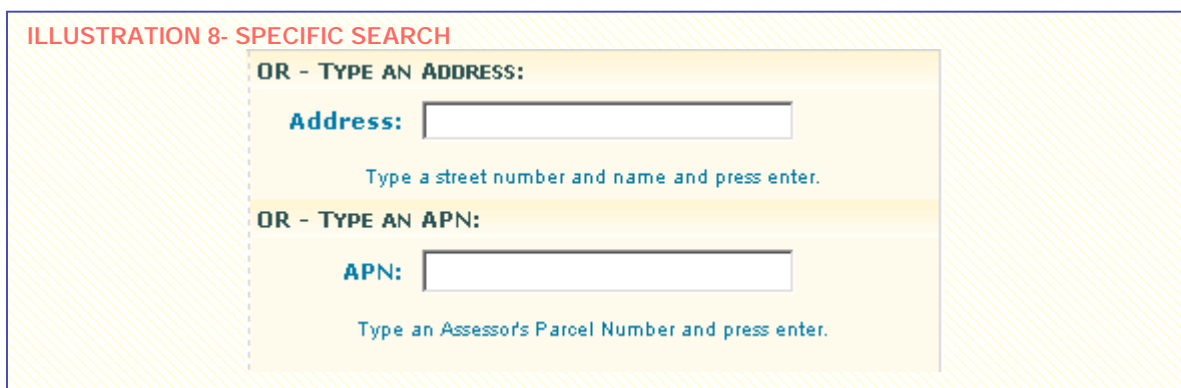
### Smart Search Bar

In the Historic Districts & Buildings website the Smart Search Bar allows “random” searching of the database, i.e., the user can type in just about anything and possible matches are displayed for his/her criteria. When the user types search criteria in the Smart Search Bar the Category Search and Specific Search fields are ignored



### Specific Search

A separate search capability was added to allow users to search by address or Assessor’s Parcel Number (APN).





## Category Search

The category search section was provided to allow people to research combinations of known categories or groups of information. When the user selects any of the categories, the Smart Search and Specific Search functions are disabled.

**ILLUSTRATION 9- CATEGORY SEARCH**

The screenshot shows a search form with the following fields and options:

- Style: [Dropdown]
- Builder: [Dropdown]
- Architect: [Dropdown]
- Property Name: [Dropdown]
- Original Use: [Dropdown]
- Decade Built: [Dropdown]
- Designation Type: [Dropdown menu open with options: before 1880, 1880 - 1899, 1900 - 1919, 1920 - 1939, 1940 - 1959, 1960 - 1979, 1980 and later]
- District: [Dropdown]
- Clear All button

## Search Results

If a specific search criteria finds a single match in the database, the property report page for that search is immediately displayed. If more than one match is found a search results page is displayed and the user can select a record to view its report or click a button for the next set of eight records.

**ILLUSTRATION 10- SEARCH RESULTS**

SEARCH RESULTS: TOTAL RECORDS: 286

RECORDS 1 - 8 [PREVIOUS 8](#) [NEXT 8](#)

ID	Address	APN	Builder	Year Built	Original Use	Architect
431	3594 Beechwood Pl	217256001	WJ Nethery and Son	1926	Single Family Residence	Unknown
8408		215-192-005	Unknown	1940	Industrial	Unknown
587	3343 Brockton Av	214112013	Unknown	1915	Single Family Residence	Unknown
678	4649-51 Brockton	217050014	Henry A.O.	1931	Commercial	
775	4998 Bushnell Av	146190018	Chudzikowski, John	1900	Residence	Chudzikowski, Jo B.

## The Property Report

One objective with the Property Report page was to deliver a printable page that wouldn't require opening a separate window and wouldn't lose any significant data when printed on most printers.

**ILLUSTRATION 11- PROPERTY REPORT**

CITY OF RIVERSIDE HISTORIC DISTRICTS & BUILDINGS

CITY HOME 3900 MAIN STREET • RIVERSIDE, CA 92522 • 951-826-5311

SEARCH BY PROPERTY SEARCH BY DISTRICT HISTORIC PRESERVATION MAPZONE PROPERTY VIEWER HELP

SMART SEARCH [ ] TYPE YOUR SEARCH CRITERIA AND PRESS ENTER TEXT ONLY WEBSITE

PROPERTY REPORT: [PREVIOUS] [NEXT] [RETURN TO RESULTS PAGE]

ADDRESS 3649 Mission Inn Av  
APN 213-231-001  
NAME Mission Inn  
ARCHITECT Benton, Arthur B.  
ORIGINAL USE Hotel  
YEAR BUILT ca 1902  
BUILDER Boggs, Wilcox and Rose  
STYLE Mission Revival  
CONTEMPORARY USE

SURVEY DESCRIPTION: (SELECT A SURVEY YEAR BELOW)

1997  1998  1999  2000  2001

The Mission Inn is a large six-story complex with red-tile roofs. The two Mission Inn buildings of the hotel itself and the employees' quarters, occupy one entire city block and part of another, more than three acres. The Mission Inn proper is built around three principal courts or patios on the ground level, and with other

PROPERTY PHOTO :

MAP:

## Using Sections to Display Data Sets

The top of the report page shows detail about the specific property record. The Previous and Next buttons scroll through the set of records that had been displayed on the search results page. If an image is available in the database it is displayed to the right of the detail.

**ILLUSTRATION 12- PROPERTY REPORT – PREVIOUS/NEXT**

PROPERTY REPORT: [PREVIOUS] [NEXT] [RETURN TO RESULTS PAGE]

ADDRESS 3649 Mission Inn Av

PROPERTY PHOTO :

Because there may be more than one survey for any given property, a Survey Year Selector is displayed below the detail pane. The complete data for the selected Survey Year is displayed below the selector buttons on the left side of the page and a property map is displayed on the right side.

**ILLUSTRATION 13- PROPERTY REPORT – SURVEY YEAR**

SURVEY DESCRIPTION: (SELECT A SURVEY YEAR BELOW)

1997  1998  1999  2000  2001

The Mission Inn is a large six-story complex with red-tile roofs. The two Mission Inn buildings of the hotel itself and the employees' quarters, occupy one entire city block and part of another, more

MAP:

Supplemental or additional data is displayed on the right side below the property map. The titles in the Additional Data section are links to help text wherever possible.

**ILLUSTRATION 14- PROPERTY REPORT – ADDITIONAL DATA**

includes the Catacombs and the Catacombs extension walkway, all of brick and concrete construction. In 1973 the rooms of the Mission Wing were converted into apartments. The Court of the Birds, created by the U-shaped Mission Wing, originally contained the original Glenwood Cottage, razed in 1948 for the swimming pool that is there today. The Court includes the Campanario, Bernal's Boats, Bells, and Cannon. The tall palm trees lining the

**ADDITIONAL DATA:**

THEME: Commercial Development

PERIOD OF SIGNIFICANCE: 1902-1950

AREA OF SIGNIFICANCE: City of Riverside

Landmark information and linkable Designations are displayed below the supplemental data on the right. This leaves a “flexible” pane on the left for any amount of data to expand into.

**ILLUSTRATION 15- PROPERTY REPORT – LANDMARKS & DESIGNATIONS**

The fourth floor rooms are later additions, 1923-24, and are constructed of hollow clay tile with timber roof supports and tile roofs above. The basement of this wing includes the Refectory, the Music Room, the Glenwood Tavern, and the northern portion of the Catacombs known as the Cloister Walk. The Garden of the Bells is a later addition constructed in 1912 and is of reinforced concrete construction covered with stucco. THE SPANISH WING is the third wing of the Mission Inn. After successive trips to Europe, particularly Spain and Italy, Frank Miller engaged architect Myron Hunt to design this wing that was completed in 1914. Much of the

Frank A. Miller (1857-1935) made the adobe bricks for a small 12-room guest house that he opened in 1876. Over the years he added to the building to create this remarkable Mission Revival Style Building.

**DESIGNATIONS:**

- [City Landmark #1 -](#)
- [County Landmark](#)

And, finally, the Significance report is displayed below the primary data pane.

**ILLUSTRATION 16- PROPERTY REPORT – SIGNIFICANCE REPORT**

**SIGNIFICANCE:**


Begun in 1876 as a small hotel called Glenwood Cottage, the present day Mission Inn was enlarged and embellished by Frank A. Miller. This building today is the largest Mission Revival building in California. The many sections of the structure evolved as Frank Miller travelled and gathered building parts such as fountains

The fully assembled report page is usually long and requires vertical scrolling. While this is not desirable in website browsing, the fact that all of the information for a given data set is displayed on one page outweighs any negativity over scrolling. The user is able to print a complete report and the page layout ensures that significant data is captured with a browser print function.

Also, report or results pages may be bookmarked for future reference allowing researchers to easily return to any page displaying specific data.

# The Full Report Page

## ILLUSTRATION 17- PROPERTY REPORT – FULL PAGE



**HISTORIC DISTRICTS & BUILDINGS**


CITY HOME 3900 MAIN STREET • RIVERSIDE, CA 92522 • 951-926-5311

SEARCH BY PROPERTY
SEARCH BY DISTRICT
HISTORIC PRESERVATION
MAP ZONE
PROPERTY VIEWER
HELP

**PROPERTY REPORT:**

PREVIOUS    NEXT    RETURN TO RESULTS PAGE

**ADDRESS:** 3649 Mission Inn Av  
**APN:** 213-231-001  
**NAME:** Mission Inn  
**ARCHITECT:** Benton, Arthur B.  
**ORIGINAL USE:** Hotel  
**YEAR BUILT:** ca 1902  
**BUILDER:** Boggs, Wilcox and Rose  
**STYLE:** Mission Revival  
**CONTEMPORARY USE:**




**SURVEY DESCRIPTION: (SELECT A SURVEY YEAR BELOW)**

1997   
  1998   
  1999   
  2000   
  2001

The Mission Inn is a large six-story complex with red-tile roofs. The two Mission Inn buildings of the hotel itself and the employees' quarters, occupy one entire city block and part of another, more than three acres. The Mission Inn proper is built around three principal courts or patios on the ground level, and with other courts, patios, terraces, roof gardens and sun porches on different floors above the street elevation. The structure is composed of four major wings. THE MISSION WING was constructed in a U-shape of unreinforced brick exterior perimeter wall with a heavy timber and built-up member framing system. Each wing typically has a central main support wall running the length of each wing, which serves as one of the central corridor walls; heavy timber beams span from each of the central corridor walls. The portions of the perimeter walls above the ground level that project beyond the main walls are constructed of structural half-timbering filled in with one thickness of brick between the half-timbering. The roof structure is comprised of wood joist with strip sheathing covered with roll asphalt or tile shingles depending upon the roof pitch. A pitched tile parapet roof forms a fascia along the exterior walkway along the third floor around the inside of the "U". The basement of this wing includes the Catcombs and the Catcombs extension walkway, all of brick and concrete construction. In 1973 the rooms of the Mission Wing were converted into apartments. The Court of the Birds, created by the U-shaped Mission Wing, originally contained the original Glenwood Cottage, raised in 1940 for the swimming pool that is there today. The Court includes the Campanario, Pergola, Patis, Belle, and Cannon. The tall palm trees lining the Court were planted in 1948. A concrete pergola designed to look as though it was constructed from tree trunks and limbs covers the walkway around the west, north and east edges of the Court. A meandering stream and pool flowing from a rock grotto in the southeast corner were built in 1948. The second wing, THE CLOISTER WING, was designed by Arthur Benton and constructed between 1909-11. The basement and first floor are constructed of concrete and brick with concrete and brick walls, and concrete beams and floor slabs. The upper floor exterior walls are of brick and the interior walls are of hollow clay tile covered with plaster. The dome at the northeast corner is a thin concrete shell sitting on a concrete drum which in turn rests on unreinforced brick walls. The fourth floor rooms are later additions, 1923-24, and are constructed of hollow clay tile with timber roof supports and tile roofs above. The basement of this wing includes the Refectory, the Music Room, the Glenwood Tavern, and the northern portion of the Catcombs known as the Cloister Walk. The Garden of the Bells is a later addition constructed in 1912 and is of reinforced concrete construction covered with stucco. THE SPANISH WING is the third wing of the Mission Inn. After successive trips to Europe, particularly Spain and Italy, Frank Miller engaged architect Myron Hunt to design this wing that was completed in 1914. Much of the Miller family's art and collections were either exhibited inside this wing or incorporated into the fabric of the building. Ten rooms were added in the 1920s on the third and fourth floors of the structure were designed by Arthur Benton and G. Stanley Wilson. This wing is of reinforced concrete construction throughout. The fourth floor rooms are of hollow clay tile construction with heavy timber beam roof structure and glazed tile roofs. The Spanish Patio was also constructed as part of this addition and the west, south, and east walls of the patio which were originally part of the Mission and Cloister wings were modified during this period to fit in with the Spanish motif of the addition. The open walkways on the west side of the patio are of reinforced concrete. The fourth and final wing, THE INTERNATIONAL WING, comprises the entire northwest corner of the Inn and was built between 1929-31 out of reinforced concrete. The walls, beams, floor slabs and exterior walls are of reinforced concrete. The fourth floor rooms are all of hollow tile construction with concrete roof framing supporting clay tile roofs. The International wing was organized around three interior courtyards, all of which were ornately decorated in the spirit of international harmony. The first court is the Rotunda. The Rotunda is the full height of the building, a total of six stories. It is open to the sky - At the floor of the Rotunda is a tile fountain, a replica of the famous Goseman Fountain of Nuremberg.

**SIGNIFICANCE:**  
 Begun in 1876 as a small hotel called Glenwood Cottage, the present day Mission Inn was enlarged and embellished by Frank A. Miller. This building today is the largest Mission Revival building in California. The many sections of the structure evolved as Frank Miller travelled and gathered building parts such as fountains, fireplaces, grilles, tiles and bells from Europe and the Far East.

**MAP:**



**ADDITIONAL DATA:**

THEME: Commercial Development  
 PERIOD OF SIGNIFICANCE: 1902-1950  
 AREA OF SIGNIFICANCE: City of Riverside  
 RESOURCE ATTRIBUTES: HP05  
 CHR/NRHP STATUS CODE: NATIONAL REGISTER A, B & C  
 CRITERIA:

**REPORT CITATION:**  
 PERMIT HISTORY:  
 ADDRESS HISTORY:  
 REFERENCES:  
**CITY LANDMARK PLAQUE TEXT:**  
 Frank A. Miller (1857-1935) made the adobe bricks for a small 12-room guest house that he opened in 1876. Over the years he added to the building to create this remarkable Mission Revival Style Building.

**DESIGNATIONS:**

- City Landmark #1 -
- County Landmark
- District Contributor - Mission Inn Historic District 11/20/1985
- District Contributor - Seventh Street Historic District 9/29/1989
- District Contributor - Seventh Street 5th Historic District
- National Historic Landmark - 5/14/1977
- National Register of Historic Places - 5/14/1971
- State Landmark - #761
- State Point of Historical Interest

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## Using ArcIMS for Internet Maps

ESRI software is used to make two types of maps: *district* and *property*. The *district maps* were created as static images using desktop ArcMap. The *property maps* for historic survey reports are generated dynamically for each property.

The city of Riverside uses ArcIMS to create maps for the Internet. We use the ActiveX connector for the historic property viewer. The entire historic web viewer is written using ASP.NET and Visual Basic, and the Active X connector works fairly well with the .NET platform. The Active X Connector is not installed by default, but can be easily added to the ArcIMS installation by running the installation CD a second time. This web site runs on a single web server with dual processors running Windows 2000, several ASP.NET web applications, a small SQL Server database, and ArcIMS using shapefiles. Even with all aspects of the application running on one server, ArcIMS can usually generate a map in less than 10 seconds.

Maps are considered to be an important element of the overall GIS web application, but not necessarily the main feature. The map is one element of the overall report page with all the survey information about the selected historic property. This information has been pre-recorded over the past 25 years and stored in a database that is queried by the ASP.NET application when it generates a property report. We needed to answer the question of how to create dynamic maps on the report page for each property and decided to generate the map when the user requests the report.

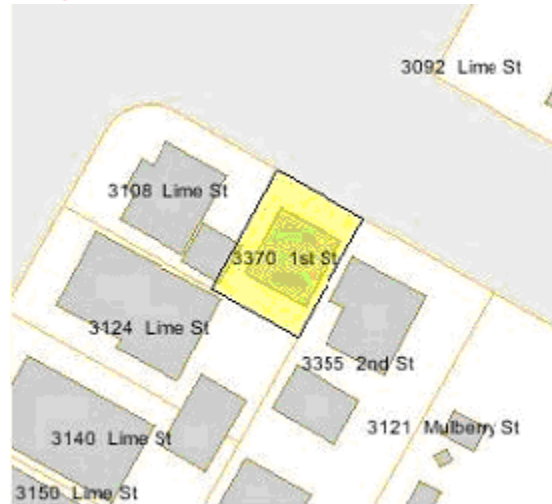
An equally valid alternative for some cities smaller than Riverside, would be to generate all the map images ahead of time. In fact this was done for each of the historic district maps that are used for the district report page, since there are much fewer districts than the number of properties. These static maps are highly informative and cartographically pleasing, and load as quick as any other existing image.

ILLUSTRATION 18 – DISTRICT MAP



*Property* maps are generated when the user requests a report for a particular historic property. The recorded Assessor's Parcel Number (APN) is used to find the property parcel in the current parcel layer in ArcIMS. We use the ActiveX connector to select, highlight, and zoom to and set the map extent around the property. Some records in the historic properties database do not have an assigned APN, in which case we need to produce rest of the report and skip the map generation process.

#### ILLUSTRATION 19 – PROPERTY MAP



The map generator is self-contained in a separate VB.NET class module that is included in the ASP.NET project. This isolates the Active X connection so map errors will not cause the rest of the report to fail. Typical map errors include missing APN numbers. Or, the APN for a parcel may have changed since the last survey of the historic resource.

The process of making a map requires that the ArcIMS server be registered with the ASP.NET application. The parameters for this registration can be stored in the Windows Registry and retrieved by the ASP.NET application when it is started for the first time, and saved in global variables. Every new map request makes a new connection to ArcIMS. The map extent is stored in the HTML output as four hidden variables: minimum X and Y, and maximum X and Y coordinates. These are used to save the map extent on the client side, and then inform ArcIMS about the prior map request.

The performance of the ArcIMS map image server is critical to the responsiveness of the web site. It currently takes between 5 and 10 seconds to generate a map image. The ASP.NET application includes code to report the amount of processing time in an HTML element on the page sent to the client browser. This code is contained in the VB.NET code on the server side. Here is a sample of the HTML source in the client browser with the map control messaging turned on.

```
<input name="MapStatusMessage" id="MapStatusMessage" type="hidden" value="
(14:44:46.4062500) [Page_Load] Creating instance of Property_Map object.
(14:44:46.5156250) [New] Creating instance of Property_Map object.
(14:44:46.5156250) [GetIMSMap] Getting instance of IMS Map object.
(14:44:46.5156250) [GetIMSMap] Setting server name and port on the IMS Map object.
(14:44:46.5156250) [GetIMSMap] Requesting ArcIMS to initialize the IMS Map object.
(14:44:46.5937500) [GetIMSMap] Exit
(14:44:46.5937500) [New] Setting dimensions of map.
(14:44:46.6093750) [New] Getting map extent.
(14:44:46.6093750) [New] Calling SetAddressMatchInputs function.
(14:44:46.6093750) [SetAddressMatchInputs] Getting index to layer: parcels.
(14:44:46.6093750) [SetAddressMatchInputs] Getting reference to AddressMatchInputs on layer: parcels.
(14:44:46.6093750) [SetAddressMatchInputs] Exit
(14:44:46.6093750) [New] Exit
(14:44:46.6093750) [ZoomSelect] Trying to select and zoom to parcel APN:'219291002'.
(14:44:49.5937500) [ZoomSelect] Exit
(14:44:49.5937500) [Refresh] Trying to refresh map, get X,Y extents, and URL to image.
(14:44:53.0156250) [Refresh] Exit
(14:44:53.0156250) [Page_Load] Exit " />
```

This provides a simple base line and/or status check that can be accessed from the web browser. Just access a known historic property and look at the time stamps for the server-side actions.

The map request consumes time in two steps: first, selecting a parcel with a given APN (3 seconds), and then creating the map image (3.5 seconds). During this time, ArcIMS consumes almost 100% of the CPU. If each map takes 10 seconds and uses 100% CPU, then this allows up to 6 maps per minute per CPU, 12 maps per minute for a machine with dual processors. More map requests per minute can be handled, but it will take longer for each map to be done because new map requests will have to wait for current ones to finish.

There are ways to improve this performance, and we plan to implement them in the future. For instance, separating the different parts of the application to dedicated servers is a common recommendation. Using ArcSDE instead of shapefiles map help when the ArcSDE server is running on a dedicated machine. Putting ArcIMS on its own server should allow the map server to perform better.

## Conclusion

Historic preservation plays a vital role in maintaining Riverside's character and identity. As a community effort, the preservation of cultural resources is a responsibility of all, whether the interest is for economic, aesthetic, cultural or environmental reasons. Riverside's Historic Districts & Buildings website not only makes information on the City's historic properties available to the public in an enjoyable, navigable and easy to use format, but also serves as an important planning tool for ensuring the protection of these resources over time.

## *References*

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<sup>ii</sup> Eric S. Raymond – The Art of Unix Usability -  
<http://www.catb.org/~esr/writings/taouu/html/index.html>

Dave Raggett – Adding A Touch of Style  
<http://www.w3.org/MarkUp/Guide/Style>

Ross Shannon – CSS Layout  
<http://www.yourhtmlsource.com/stylesheets/csslayout.html>

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