Montgomery County, Maryland
Apartment Rental Guide
Online Application and Web Site
Program Category #14: Information Technology

1.0 Abstract
The Montgomery County, Maryland Department of Information Systems and Telecommunications - Geographic Information Systems (DIST-GIS) team, in cooperation with the Department of Housing and Community Affairs (DHCA), developed a web-based Apartment Rental Guide to provide the public (customers) with an online tool to find rental apartments. The online Apartment Rental Guide service includes listings and information for over 400 rental apartment facilities in Montgomery County including special apartment buildings for the elderly and the disabled in addition to subsidized apartments for singles and families. Customers need only use a web browser, such as Netscape Navigator 4.7 or Microsoft's Internet Explorer 5+, to access the web site (http://gis.co.mo.md.us/dhca/). Customers can search for apartments by a) detailed criteria (rent amount, number of bedrooms, etc.), b) geographic area using a map, c) city name, d) apartment name, e) or special listing (facilities for elderly and disabled, and subsidized facilities). Details for each apartment include survey data, an exterior photo, proximity information (bus routes, school service areas, places of interest), and links to map and travel directions. The apartment data and information presented in the Apartment Rental Guide application reflects information reported annually to DHCA by apartment landlords.

2.0 Need for the Program
The Montgomery County Apartment Rental Guide web site was developed to support DHCA customer service efficiency and to provide a useful tool for customers to search DHCA's database of rental apartment information. Prior to the development of the web site, several thousand hard copies of the DHCA Apartment Rental Guide were produced each year. The hard-copy Guide is prepared each year from the database of information resulting from DHCA's annual survey of apartments. DHCA concluded that a dynamic, web-based presentation of the apartment database would empower their customers to use the apartment information far more efficiently and effectively than a printed, static guide. For example, apartment searches would be quick and easy by selecting desired criteria or a location. And, information provided could be expanded to include GIS map resources for the area in proximity to an apartment. And, DHCA's online guide would be comprehensive, listing information for all 400+ apartment facilities (unlike privately operated apartment search web sites that only list facilities that choose to advertise with them). In addition to DHCA's customers, other agencies may ultimately find the web site an invaluable tool (for example, the Fire Department might use it to find a manager or owner information for an apartment. Consequently, DHCA asked DIST-GIS to web-enable the Guide. DIST-GIS developed a sophisticated, yet simple, online Apartment Rental Guide that enables customers and staff to quickly find a Montgomery County apartment.

3.0 Description of the Program

The Apartment Rental Guide application and web site was designed and tested on the DIST-GIS Intranet Web Server connected to the Montgomery County Government Intranet. The Intranet, or internal web network, provided an effective environment for testing the web site and online applications. After a few revisions, the Intranet web site was approved by DHCA and published to the County GIS Internet Web Server for public access. The following sub-section describes the process used to develop and maintain the Apartment Rental Guide application and web site.

Apartment Rental Guide Application and Web Site Development and Maintenance

Step 1: Establish functional requirements

DHCA provided DIST-GIS with functional requirements in May of 2001 to provide a web version of the hard-copy Apartment Rental Guide that would enable customers and customer service staff to quickly find and locate an apartment in Montgomery County, Maryland using basic and comprehensive search criteria. The Guide was to provide quick access to listings and information for over 400 rental apartment facilities in Montgomery County including special apartment buildings for the elderly and the disabled in addition to subsidized apartments for singles and families. In addition, customers and staff were to be able to search for an apartment based on apartment name, location, features, types, and price ranges. Apartment features provided in the search parameters were to include building type (garden, high-rise, mid-rise, piggyback, and townhouse), utilities, pets allowed, washer and dryer, swimming pool, handicapped access, and available public transportation. Types of apartments listed in the Guide search parameters were to include efficiencies, one bedroom, two bedroom, three bedroom, and four bedroom apartments.

The web-based Guide was also to be published on a web site designed to host the online Guide application, to fit into the County's eMontgomery Portal, and to provide access to other DHCA related links, contacts, and information. The web site was to be published on the County GIS web server, so that multiple customers could simultaneously find an apartment within 5 seconds using a web browser and a standard 56 kilobyte (kb) modem connection 361 days (99%) a year. The data presented on the Apartment Rental Guide web site was to be updated annually by DHCA and prepared for web publication by DIST-GIS.
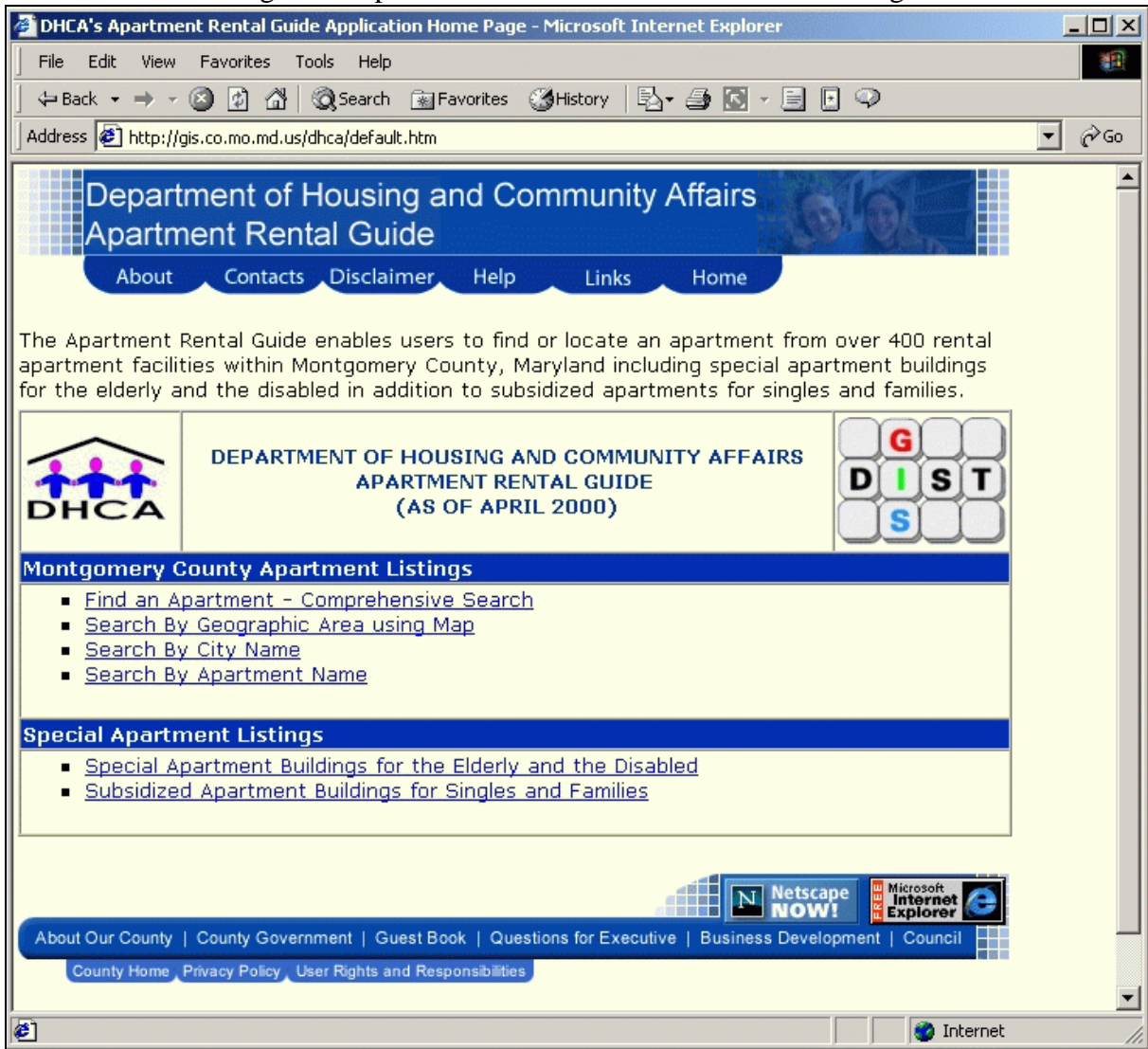
Step 2: Collect data, documents, and information

Microsoft Excel spreadsheets listing apartments in Montgomery County were provided to DIST-GIS by DHCA. Special apartments for the elderly and the disabled as well as subsidized apartments for singles and families were also included. These spreadsheets were then passed through quality control checks and exported into Microsoft Access Data tables. Digital photos of most apartments (provided by DHCA's Housing Code and Enforcement Office), contact information, useful web-links, and documents, such as DHCA's Helpful Hints for Renters, were also provided by DHCA for the web site. Detailed Apartment Rental Guide digital maps used to print previous maps in the hard-copy version were also collected, so that they could be updated and improved for the new online Guide.

Step 3: Design the web site and Create the Apartment Rental Guide Application

A web site and application were programmed with Hyper-text Markup Language (HTML) and Microsoft Active Server Page (ASP) technology using the Microsoft's Frontpage 2000 development environment. Graphics software such as Adobe Illustrator 9.0, Adobe Photoshop 6.0 and Adobe Image Ready 3.0 were used to create logos and rollover images.The web site and application were initially published on the DIST-GIS Intranet web server, a Dell Poweredge 2400 with Microsoft Windows NT 4.0 Server running Internet Information Server 4.0. The web site interface was generated with functional navigation tabs and links to enable customers to browse the web site quickly and easily (Figure 1).

Figure 1: Apartment Rental Guide Web Site Home Page

The Apartment Rental Guide web site applications were designed to enable users to find an apartment by geographic area, by city name, and by apartment name. The web site also includes additional search options to find special apartments for the elderly and the disabled as well as subsidized apartments for singles and families. In addition, customers also have the

option to conduct a more comprehensive search based on multiple search parameters to find a particular apartment (Figure 2).

Figure 2: Apartment Rental Comprehensive Search

The search results, depicting general apartment information, are then listed in a tabular format (Figure 3).

Figure 3: Search Results

The customer can then select the rental facility name, and view apartment details, including links to photos (if available), maps, as well as public transportation and public schools information (Figure 4).

Figure 4: Apartment Details

Step 4: Review and revise Web Site and Applications
DHCA reviewed and provided recommendations for the web site and online Guide over the summer of 2001. The recommendations were incorporated into the web site by DIST-GIS staff and approved by DHCA in August of 2001.

Step 5: Publish Apartment Rental Guide Web Site on the County GIS Web Server
The Apartment Rental Guide web site was published to the County GIS Web Server on September 10th, 2001. However, the web site was not formally announced until December 2001.

Step 6: Maintain web site content
Apartment rental data is maintained by DHCA in Excel spreadsheets and delivered to DIST-GIS on an annual basis. The data are then reviewed and prepared for input into the Microsoft Access database on the County Web Server by DIST-GIS. The web site content including maps, graphics, and text is updated annually by DHCA and DIST-GIS staff. The system administration of the County GIS web server is provided by DIST-GIS.

4.0 Use of Technology

The web site was initially published to the Montgomery County Government Intranet on a DIST-GIS Intranet web server, a Dell Poweredge Windows NT 4.0 Server with 512 megabytes of RAM running Microsoft Internet Information Server 4.0. Graphics and maps developed for the web site were created using several programs including ESRI's ArcView GIS (Version 3.2), Adobe Illustrator 9, and Adobe Photoshop 6.0.

Microsoft FrontPage 2000 was used as the web development environment to design, program, and test HTML and ASP scripts used to create the web site and Apartment Rental Guide. Microsoft OLE DB technology was used to connect dynamic web browser ASP scripts with the Microsoft Access database. Javascript-based rollovers, used in the navigation tabs, were created using Adobe Image Ready 3.0 software.

5.0 The Cost of the Program

The total cost to develop the DHCA Apartment Rental Guide Online Application and Web Site including staff time (programming and server maintenance) and software/hardware equipment is approximately $49,750. Approximately 160 hours of staff time were invested into the development of the web site and application at a cost of $4,500. The Intranet and Internet web servers cost a total of $28,000, while the graphic, the web publishing, and the GIS software cost approximately $15,000. Additional equipment costs and staff time for web upgrades, revisions, and maintenance will vary according to advances in technology. Annual web updates and server maintenance costs, not factored into the total cost of web site development, were estimated to be $2,250. [Note: Staff time was the primary cost to develop this application. Software and hardware (including the web server) had already been acquired for earlier projects.]

In order for a customer to use the web site or Guide, a Pentium 200 MHz or better Intel-based personal computer running Windows 95, Windows 98, Windows 2000, or Windows NT 4 with a Netscape Navigator 4.7 or Internet Explorer 5+ web browser is recommended. A standard 56kb modem with a connection to the Internet through an Internet Service Provider (ISP) should satisfy most customer needs.

6.0 The Results/Success of the Program

The performance of the DHCA Apartment Rental Guide Online Application and Web Site is currently evaluated by using web server reporting software technology and by reviewing customer feedback forms and e-mails. Since the formal announcement of the web site and

application by DHCA in December of 2001, the Apartment Rental Guide Online Application and Web Site has received an estimated 7,266 visits, an average of 3,633 visits per month. In addition, it is also estimated that 2,117 apartment location maps were downloaded during the same time period, an average of 1,058 per month.

Web server reporting software (Web Trends) enables DIST-GIS staff to count the number of visits to the web site, to locate the origin of the request, and to determine the date and time of day in which the client/server transaction occurred. Consequently, the frequency and duration of web server transactions can be monitored over time, so that the web site content and applications can be revised appropriately and that the web server can be tuned to accommodate or balance the load of requests to the web site.

So far, the site has helped to reduce the demand on staff time in responding to customer service-related questions from the general public. To date, there have been no customer complaints.

7.0 Worthiness of an Award

The DHCA Apartment Rental Guide Online Application and Web Site provides customers and DHCA support staff with tools to search, display, or link to apartment rental information in seconds rather than the time consuming effort of finding the same information in a printed guide. The use of interactive web technology to deliver, in a new way, information that has traditionally only been available in print is a milestone service achievement by DHCA and DIST-GIS. Because this will reduce the need for as many hard copy guides, a significant savings in printing costs and staff time will also be achieved. The delivery of free online Apartment Rental maps and information empowers a customer to quickly and easily find an apartment that fits their needs and other valuable proximity information 361 days per year, 24 hours per day. The ease and speed with which a customer can now search for and find apartment information greatly improves the experience of finding an apartment in Montgomery County.

The DHCA Apartment Rental Guide web site and application serve as models for other counties and municipalities who provide housing assistance and information to their communities and constituents.