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Using GIS to Promote Regional and Local Economic Development for Utilities

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Using GIS to Promote Regional and Local Economic Development for Utilities

Introduction

Economic development is a broad subject encompassing many business segments, usually a government agency or supporting service company, but it can also include utilities. If we consider the definition of economic development to be the improvement of land and infrastructure for the benefit of the community as a whole, it is clear that utilities have a key role to play. Without the participation of utilities, the fundamental services required to support development will be external to the development process and thus may limit the likelihood of success.

Specific roles for economic development may vary among business segments. For example, consider the following:

- State government: State departments of economic development provide policy leadership and services to local governments that enable communities and businesses to develop and capitalize on economic development opportunities. They help businesses locate the information and resources they need to succeed, grow, and prosper, and they also help distribute federal and state grants to local economic development programs.

- Utilities: Typically, public- and investor-owned utilities have economic development departments or divisions to coordinate with government development programs. Utilities' interests are served through growth in demand for services resulting from development but also through grants and tax incentives that encourage their participation in the programs.

This paper will examine how geographic information system (GIS) technology significantly enhances the applications and services that are part of a typical set of economic development programs.

Economic Development Applications

Applications that are highly suitable for GIS consist of

- Property listing
- Housing development
- Community development
- Business/Demographic indicator reports
- Visualization/Marketing

Within these applications, a set of common functions may be found:

- Interactive Site Selection: Address, GPS, click on map
- Criteria: Size, geography, proximity analysis
- Property Type: Retail, office, brownfield, vacant, and so forth
- Services: Utilities, schools, Wi-Fi, transportation, and so forth

- Reports: Up-to-date demographic information
- Multimedia: Photos, imagery, video
- Managing Prospects: Lists, e-mail, whom to contact

One may arbitrarily define three levels of functionality—basic, intermediate, and advanced—for implementation of GIS-based economic development tools. Table 1 illustrates the functionality of the three levels suggested.

Table 1
Utility Economic Development Functionality

Functionality	Level 1 Basic	Level 2 Intermediate	Level 3 Advanced
Basic Map Functions and Visualization	X	X	X
Street Maps and Directions	X	X	X
Find Addresses and Places	X	X	X
Satellite and Aerial Images	X	X	X
Topographic Maps		X	X
Host User Data (point, line, polygon)		X	X
Batch Geocoding		X	X
Thematic Mapping and Reports	X	X	X
Locate Landline/Cell Phone		X	X
Locate IP Address		X	X
Business Listings	X	X	X
Elevation Data		X	X
Traffic Data		X	X
Integration with Other Systems			X
ArcGIS® Business Analyst (or Business Analyst Online℠) Server Trade Area Analysis/Reports			X
Business and Demographic Reports	Some	More	Many

Level 1—Basic

Level 1 constitutes a basic vision for a beginning economic development application. This vision provides basic mapping and query functionality and a minimum number of standard reports (typically delivered through a Web interface).

Application development services would leverage hosted application and data Web services offered by third-party demographic information providers. Users can access GIS content and capabilities through external services without hosting the data or developing the GIS applications themselves. The result is significant savings of development time, money, and computer resources.

Examples of hosted data (collected from counties and municipalities in the area of interest) include zoning, parcel, or land-use planning layers as well as images of buildings or property available for development. A sample Internet portal for a basic economic development application is shown in figure 1.

The following is a typical list of core functionality available with a level 1 application.

- Data query and locate functions
    - Type: Retail, office, industrial, vacant, and so forth
    - Square footage: Min/Max

- Units: Square feet/Acres
- Community geography: City/County boundary
- Properties for lease/sale
- Find property by parcel identification number (PIN)
- Find property by address

- Map navigation and map feature identify functions

  - Zoom to property
  - Photo of property
  - Basic property information
  - Broker contact information
  - Available utilities
  - Parcel land-use/zoning information

- Reporting functions

  - Specify a ring search radius in miles around a property of interest to prepare the following online reports:

    - Demographic Profile (see figure 2)
    - Consumer Expenditure
    - Business Summary

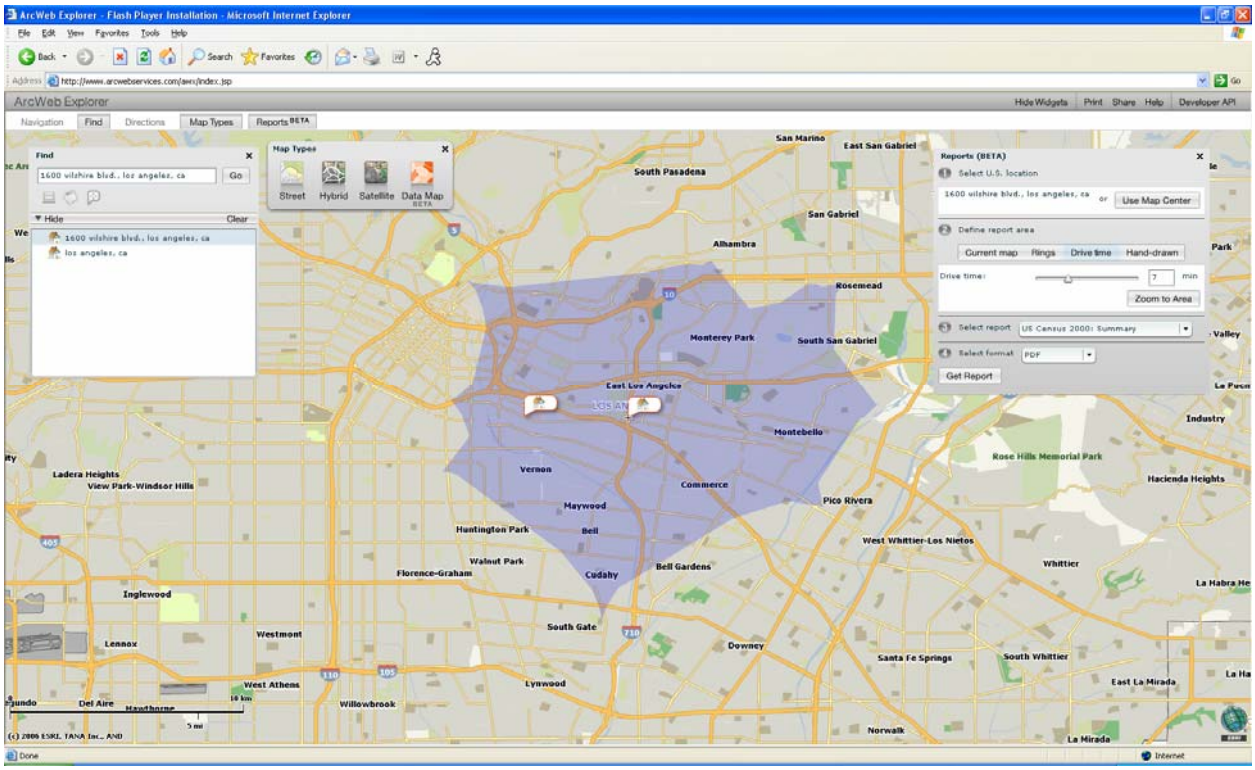
Level 2—Intermediate

The intermediate vision builds on the basic capabilities of level 1 by adding more advanced GIS toolsets to streamline and enhance the end user experience. The level 2 application offers a far more extensive set of functionality that advances the company's economic and business development objectives.

Level 2 would likely accommodate subscription access to a greater range and depth of online reports and increase the total amount of hosted content to include significantly more data such as video or other multimedia content.

Most important, the intermediate-level application would leverage scripting capabilities of Web applications. End users would benefit from a rich Internet mapping application and all the advantages of the Web content such as Adobe® Flash®.

Figure 1
Typical Economic Development Web Portal



- Data query and locate functions
  - All level 1 functions
  - Find property by phone number
  - Find property by census geography: ZIP Code™, metropolitan statistical area (MSA)
  - Find this computer IP address
- Map navigation and map feature identify functionality
  - All level 1 functions
  - Video of property as available

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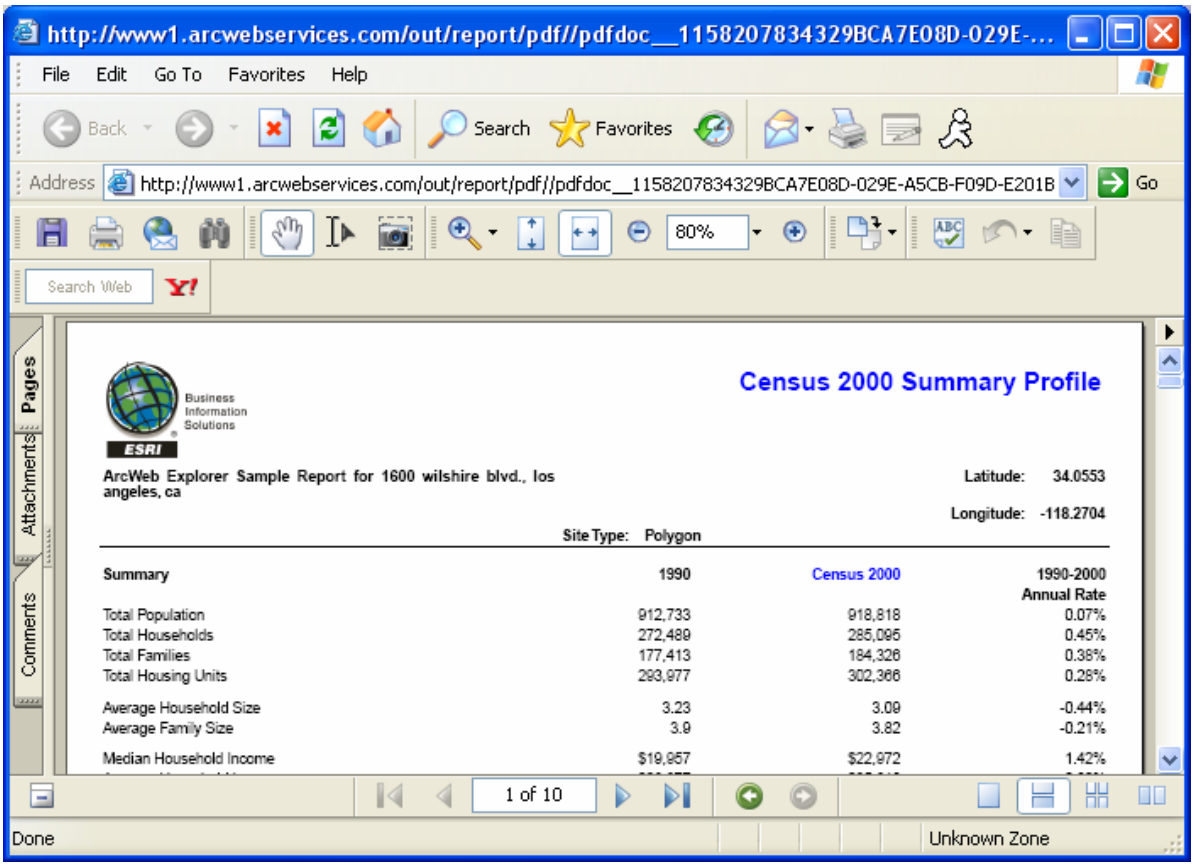
Figure 2
Demographic Information Report



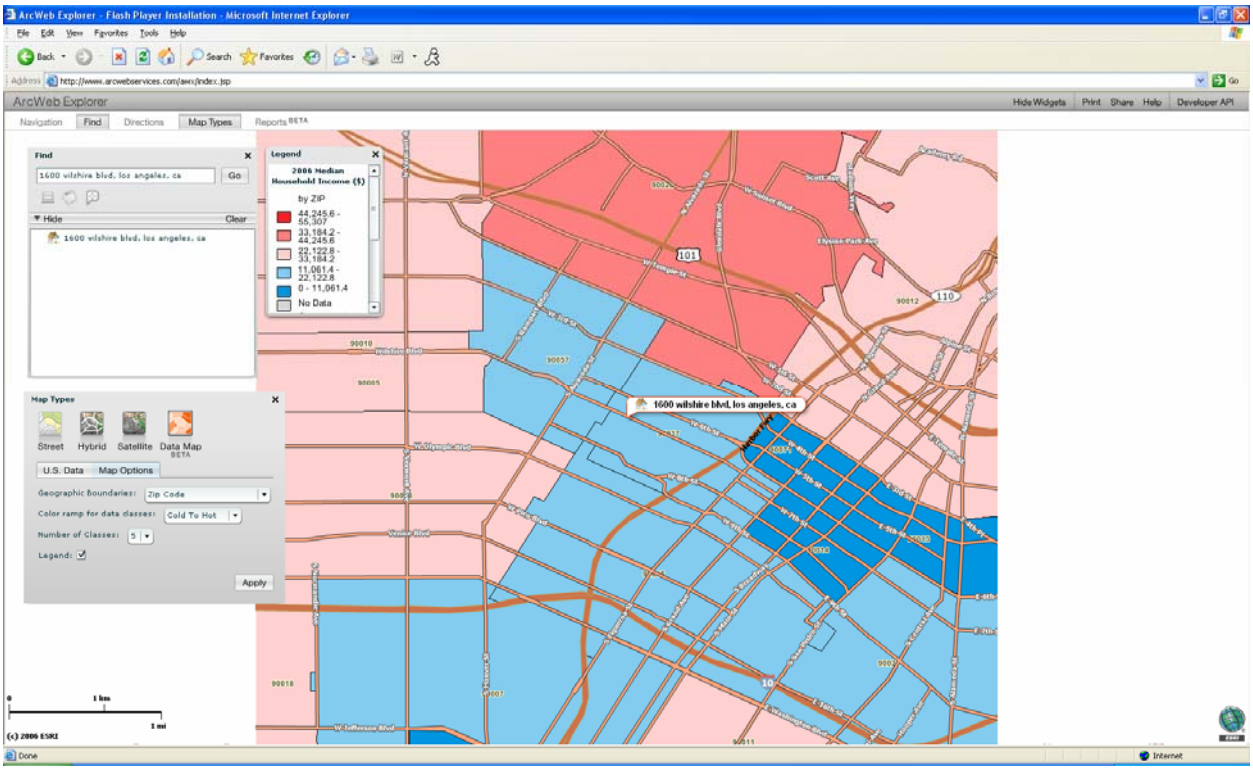
- Reporting functions
  - Search by any of the following methods to request any of the online reports listed below:
    - Current map extents
    - Multiple concentric search rings (miles/kilometer options for rings)
    - Within a specified drive time
    - User-defined, hand-drawn polygon analysis and reports
  - Reports can be downloaded in any of the following formats:
    - PDF
    - Microsoft® Word
    - HTML
    - Microsoft (MS) Excel®
    - XML

- Use any of the following reliable business and demographic forecasts and projection reports:

  - Business Summary
  - Demographic and Income Profile
  - Housing Profile
  - Market Profile
  - Retail Goods and Services Expenditures
  - Census 2000 Summary Profile
  - Tapestry™ Segmentation Area Profile
  - Detailed Age Profile
  - Detailed Income Profile
  - Disposable Income Profile
  - Graphic Profile
  - Traffic Counts
  - Net Worth Profile
  - Recreation Expenditures
  - Enhanced 3D Relief Site Map

Figure 3 illustrates some level 2 functionality including a form used to locate property that may be of interest to the user.

Figure 3
Locate Property Information Screen



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Level 3—Advanced

The advanced vision would include those functions identified under the level 2 vision as well as optional extensive additional functionality such as

- Development of an executive dashboard to provide executives at different levels with access to the data/application (real time) that they need to make business decisions and support business development goals
- Creation of My Company functionality where users can save a list of the properties and analyses that interest them
- Integration with other company IT systems such as billing
- Workforce development skills data

A Hypothetical Economic Development System

Viewed at a high level, a typical system would consist of a scalable GIS solution compliant with modern service-oriented architectures (SOA) to support the targeted economic development Web site.

Figure 4
Economic Development System Overview

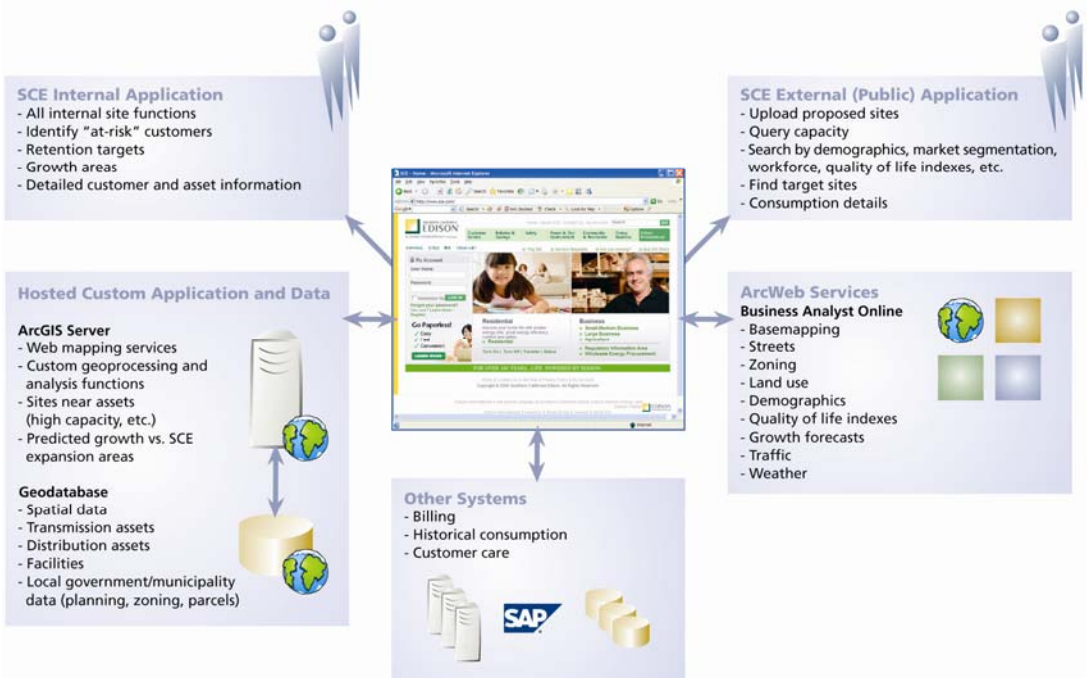

Figure 4 presents a high-level depiction of a typical vision for an economic development site. Central to this solution is a Web services product and the related online Web services. The Web services would be a hosted set of spatial data and GIS functionality delivered over the Internet to desktop- and browser-based applications. Users would access GIS content and capabilities without hosting the data or developing the GIS applications themselves. The result would be significant savings of development time and money as well as staff and computer resources.

Specialized custom analysis functions could be developed and deployed as Web services accessed by the site, in conjunction with more general Web services, to provide users with the ability to identify sites of interest, taking into account details of the company's assets.

System Integration

The integration scenarios alluded to in figure 4 could be provided by way of an enterprise middleware component or facilitated with point-to-point methods or direct data access.

Finally, the services could be deployed and integrated in such a way as to segment the functionality for different groups of internal and external users. For example, an internal site could provide functions consistent with business processes like customer retention and marketing, while an external site would offer focused solutions for the company's customer base such as site selection or consumption history. The suite of functions could be delivered as a customizable dashboard of capabilities from which users could select those of interest to them and save query criteria.

A list of typical reports would be

- Demographic Profile
- Consumer Expenditure
- Housing Profile
- Market Profile
- Retail Goods and Services Expenditures
- Census 2000 Summary Profile
- Tapestry Segmentation Area Profile
- Detailed Age Profile
- Automotive Aftermarket Expenditures
- Detailed Income Profile
- Disposable Income Profile
- Financial Expenditures
- Graphic Profile
- House and Home Expenditures
- Household Budget Expenditures
- Medical Expenditures
- Net Worth Profile
- Recreation Expenditures
- Enhanced 3D Relief Site Map: One site per map
- Traffic Profile
- Business Summary: SIC or NAICS

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Economic Development Examples

Figure 5 illustrates a report taken from the U.S. Census American FactFinder Web page.

Figure 5
Census Demographic Information Report

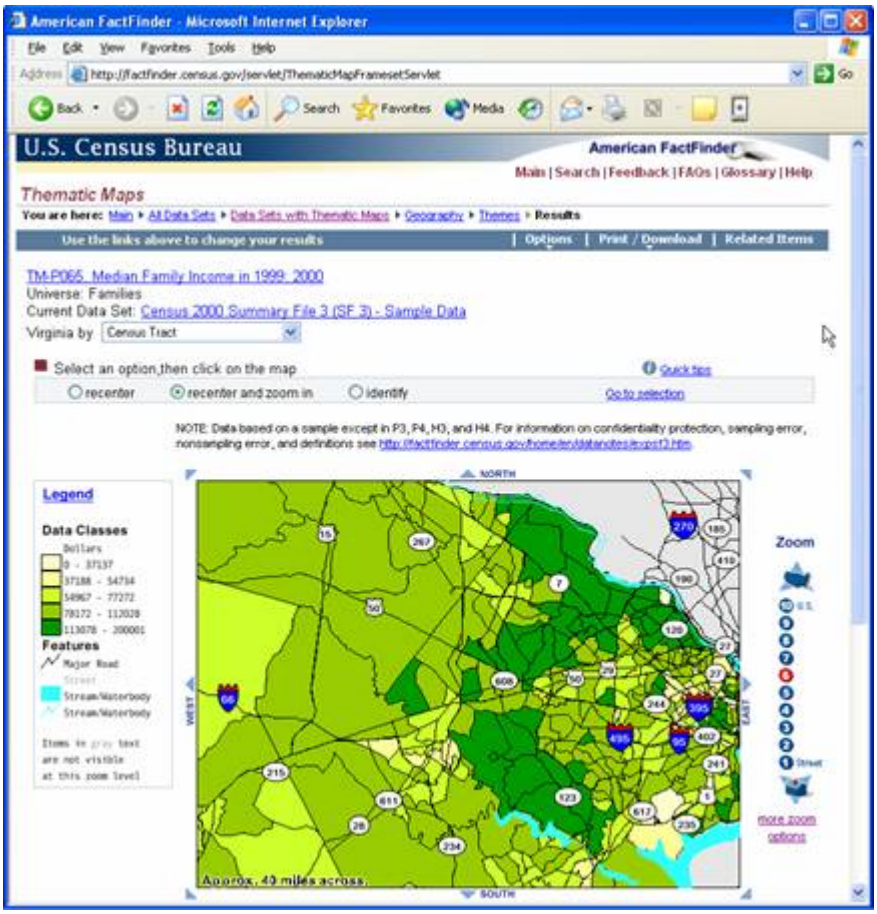
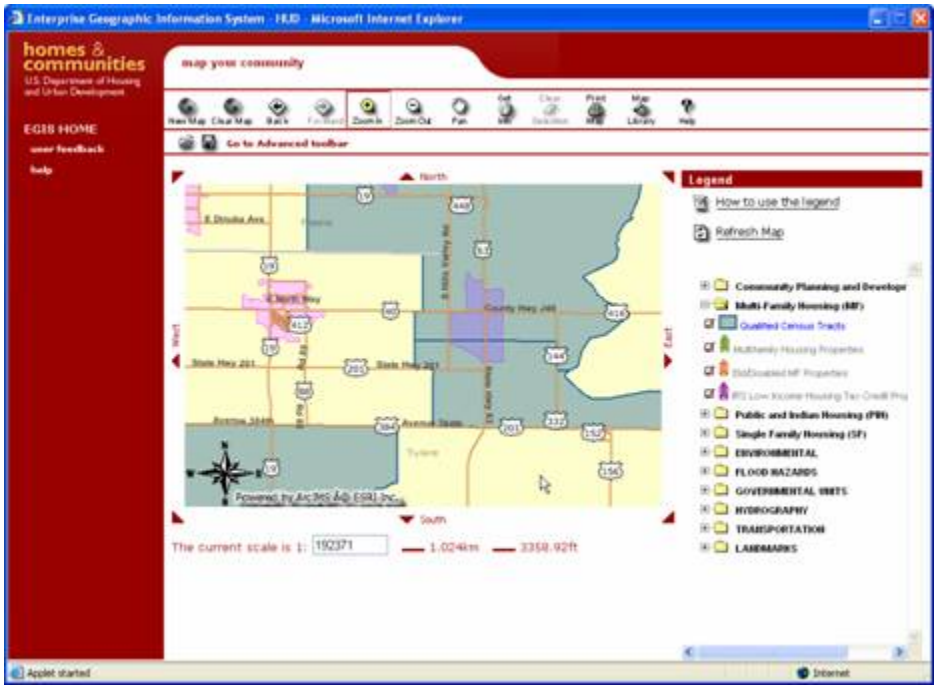


Figure 6 shows an E-Map from the U.S. Department of Housing and Urban Development (HUD) Web map.

Figure 6
Available Properties Display



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Figures 7, 8, and 9 are sample Web pages from the Virginia Economic Development Partnership site.

Figure 7
Virginia Economic Development Partnership Main Web Page

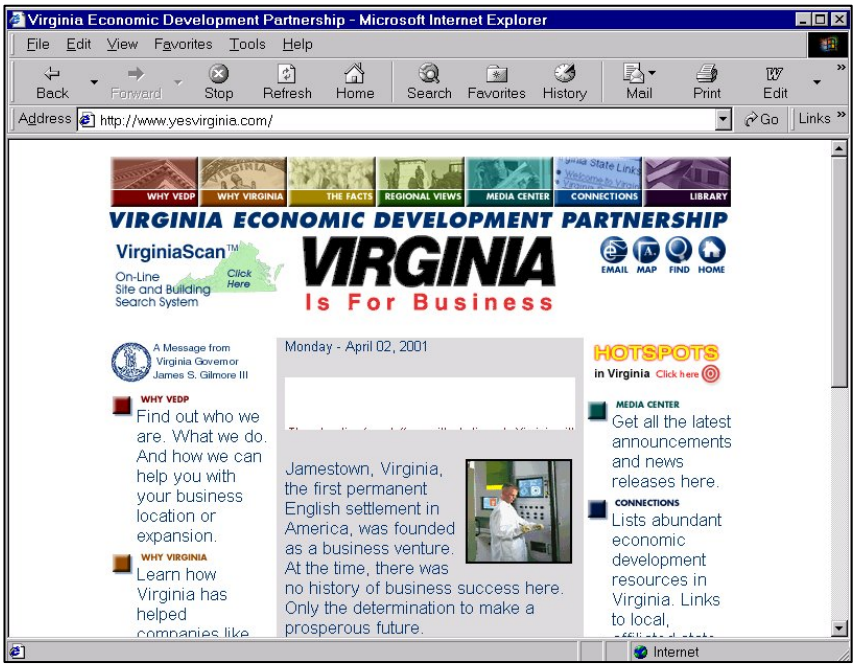

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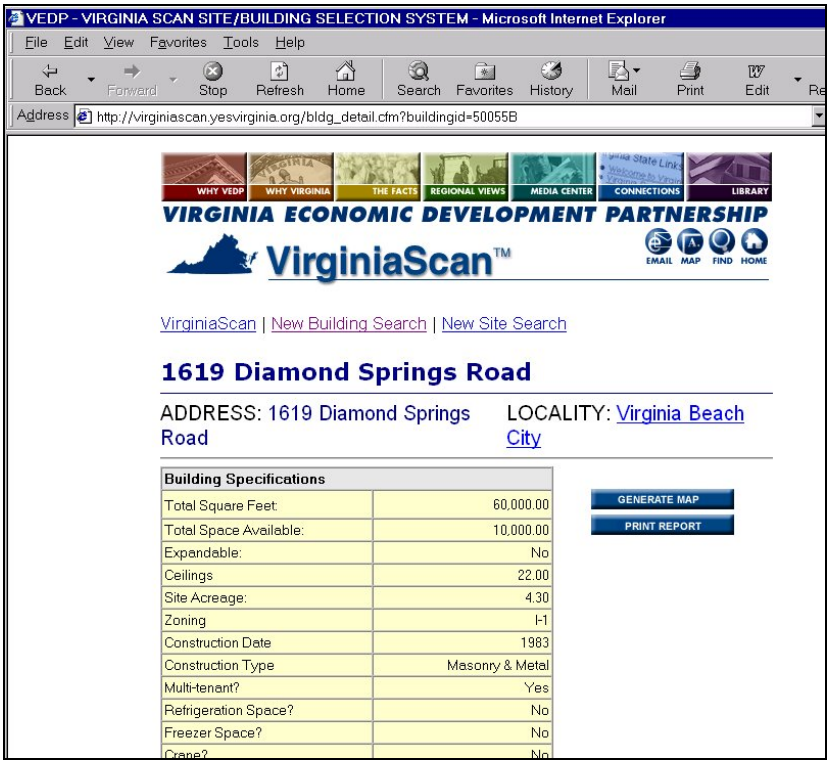
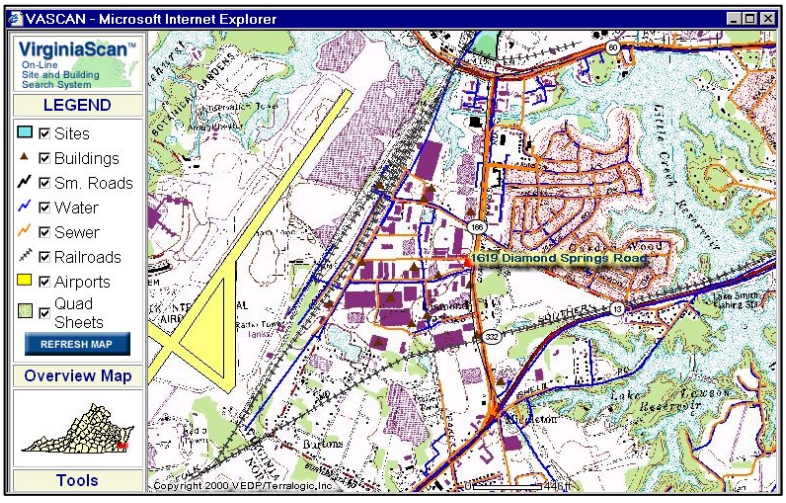
Figure 8
Building Search Details Report



Building Specifications	
Total Square Feet:	60,000.00
Total Space Available:	10,000.00
Expandable:	No
Ceilings	22.00
Site Acreage:	4.30
Zoning	I-1
Construction Date	1983
Construction Type	Masonry & Metal
Multi-tenant?	Yes
Refrigeration Space?	No
Freezer Space?	No
Crane?	No

Figure 9
Available Properties Map



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Figures 10 and 11 are Web pages from the Nebraska Public Power District (NPPD) site. Economic development factors are important to customers in selecting the best site for their relocation and expansion. NPPD provides a Web-based GIS tool to allow users to conduct detailed searches for available sites using both spatial and tabular queries. Results are provided in both map and text formats.

Figure 10
Example of Property Information Available

Figure 11
Demographic Information Available for Selected Site

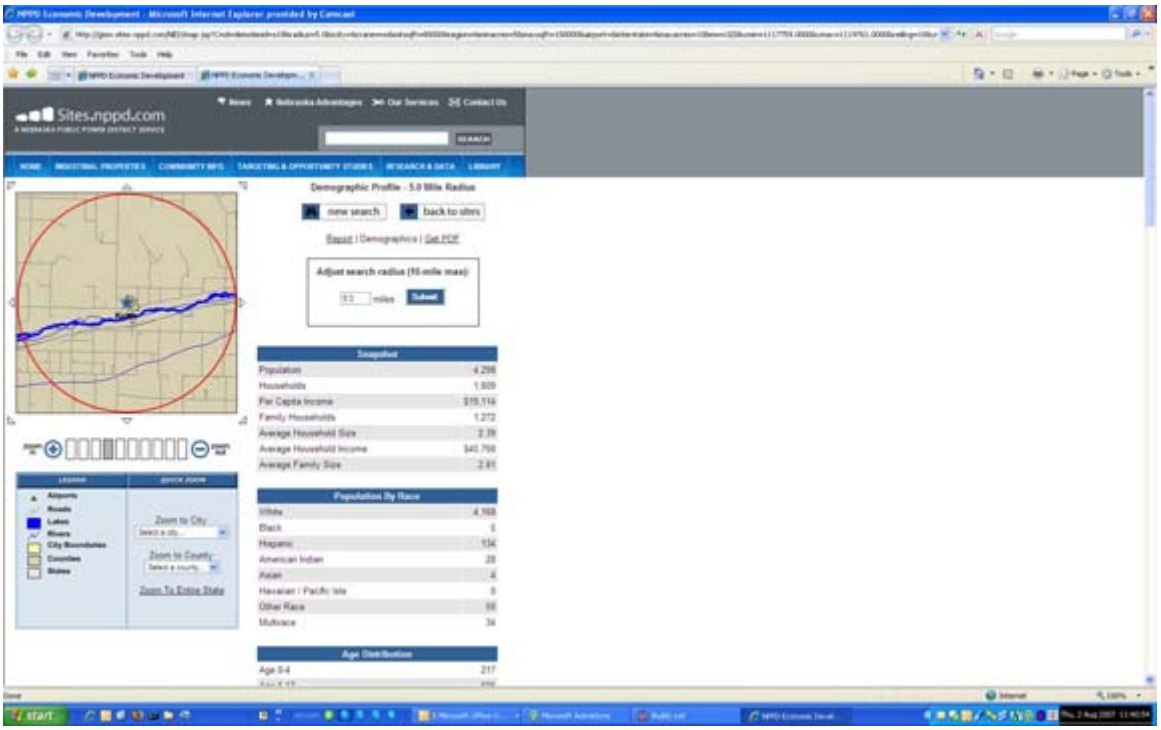

Figure 12 is a Web page from the Duke Energy site. The Duke Energy economic development Web site provides any person or corporation considering relocation or expansion in the Carolinas with a quick search on user-defined criteria to identify prospective communities and available buildings/sites. This Web site was designed for nontechnical users from the general public and corporations to be able to easily see the benefits of locating in the Carolina region.

The community search function allows users to search for actual communities throughout the region where their needs will be best met. Users can also overlay data layers like unemployment rates, median household income, existing business NAICS codes, and educational attainment of the current population.

After users find a community that meets their needs, they can then utilize the property search function to identify sites or buildings using a wide range of criteria including acres, square footage requirements, utility hookups, and even transportation corridors. Alternatively, they can use the identify function on the map and simply click on a potential site (represented by the green diamond on figure 12) or an available building (represented by the blue house shape) and retrieve the characteristics of that site or building. Users can save their favorites in My Prospects for a final comparison.

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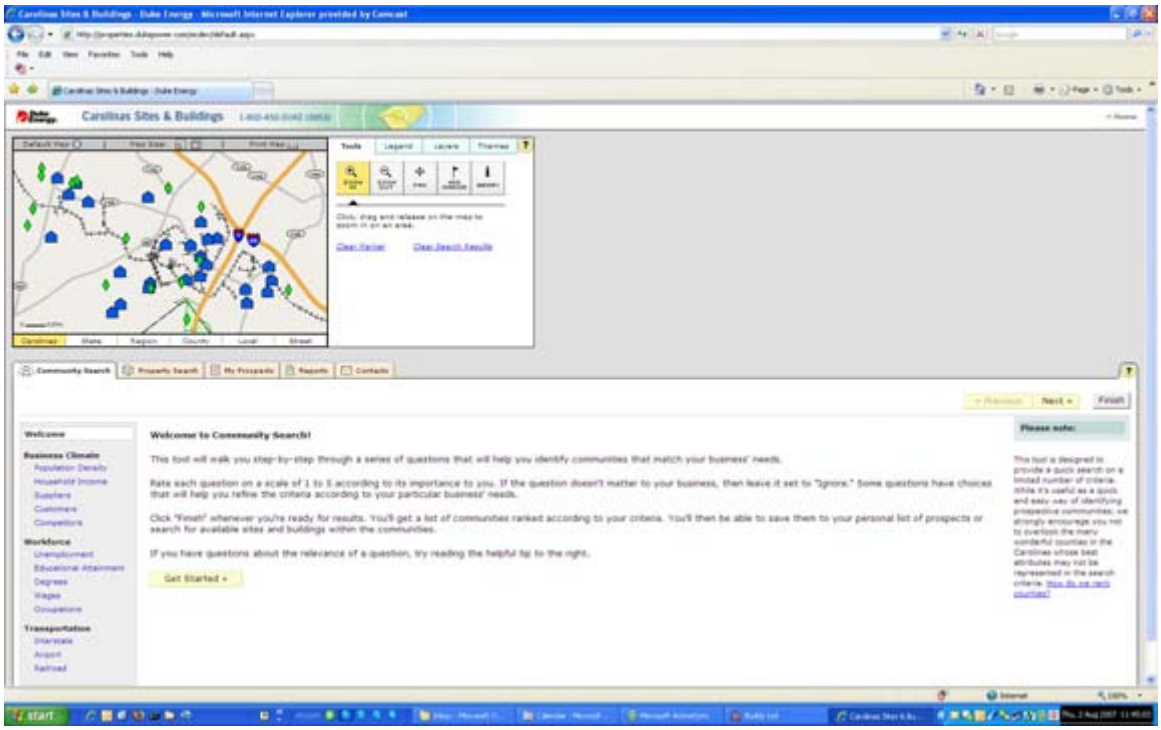
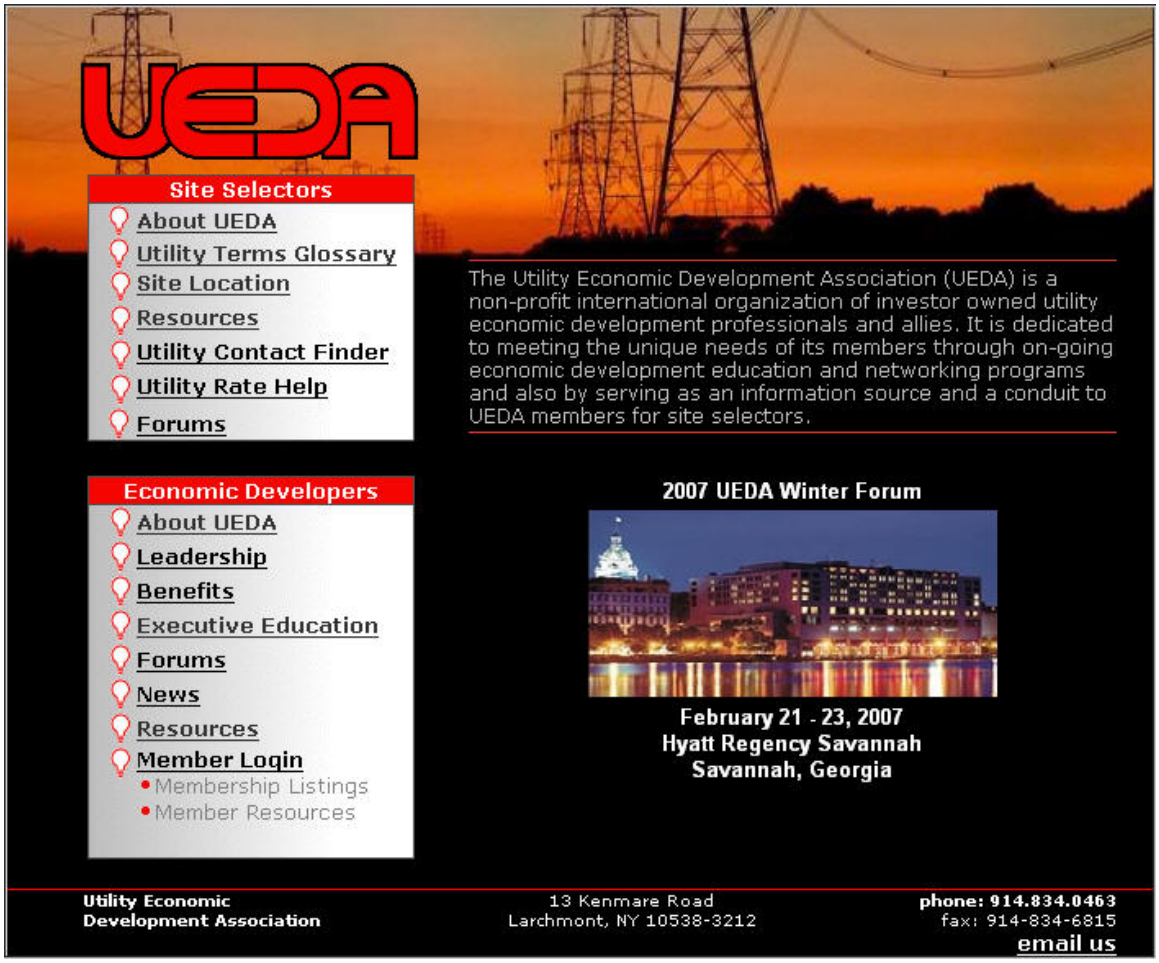
Figure 12
Example of Available Properties around Charlotte, North Carolina



Opportunities for Utilities

Economic development provides a means for a typical utility to add to its customer base through cooperation with government. Figure 13 shows the home page of the Utility Economic Development Association (UEDA). For more information, visit the UEDA Web site at www.utilityeda.com.

Figure 13
Utility Economic Development Association Home Page



Conclusion

This paper has attempted to define economic development and identify how GIS plays a key role in delivering the information needed to support the development program. Illustrative examples of successful, GIS-intensive economic development programs were presented to show how the use of GIS technology facilitates the process of presenting local development opportunities to prospective customers using the Internet.

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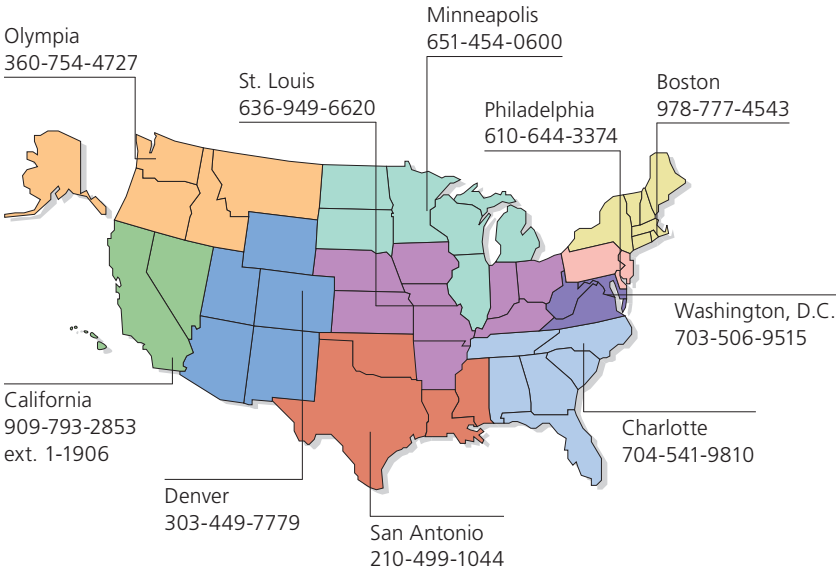

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